



Desert Harvest Solar Project

Draft Environmental Impact Statement and Draft California Desert Conservation Area Plan Amendment

Volume 4: Appendix C-5 – Appendix J

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Table of Contents

CONTENTS OF VOLUME 4

Appendix C.5	Aspen Fall 2010 Botanical Survey Memo
Appendix C.6	Biological Resources Technical Report
Appendix C.7	Winter Golden Eagle Survey Report
Appendix C.8	Draft Desert Tortoise Translocation Plan
Appendix C.9	Draft Bird and Bat Conservation Strategy
Appendix C.10	Draft Integrated Weed Management Plan
Appendix C.11	Request to USACE for Jurisdictional Determination
Appendix C.12	Applicant Memo on Mitigation Land
Appendix C.13	Mojave Fringe-toed Lizard (<i>Uma scoparia</i>) Habitat Assessment
Appendix D	Air Quality / Greenhouse Gas Calculations
Appendix E	Water Supply Assessment
Appendix F	Noise Calculations
Appendix G	Visual Resources
Appendix G.1	Approach to Baseline Analysis
Appendix G.2	Summary of Key Observation Point Analyses
Appendix G.3	Scenic Quality Field Inventory
Appendix G.4	Visual Contrast Rating Data Sheets
Appendix H	Traffic Impact Study
Appendix I	Cultural Resources – Tribal Contact List
Appendix J	Mitigation Monitoring and Reporting Plan (Final EIS only)

Appendix C.5

Aspen Fall 2010 Botanical Survey Memo



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PROJECT MEMORANDUM
ENXCO DESERT HARVEST PROPOSED SOLAR PROJECT

To: Ian Black, enXco
From: Scott D. White, Aspen Project Manager
Date: April 18, 2011
Subject: Desert Harvest project site, fall 2010 botanical surveys

This memorandum describes methods and results of Aspen's late-season (fall 2010) botanical surveys at the proposed Desert Harvest solar project site. These late-season surveys cover the entire Right of Way Application (consisting of two discontinuous parcels, described below). The larger, eastern parcel was surveyed for rare plants during spring 2010 by AMEC Earth & Environmental Inc., as documented in *Desert Harvest Spring 2010 Focused Special-Status Plant Species Survey* (AMEC 2011). Two special status plants were reported on the site: Emory's crucifixion thorn (*Castela emoryi*) and Utah vine milkweed (*Funastrum [=Cynanchum] utahense*). The AMEC report recommended fall surveys for late flowering glandular ditaxis (*Ditaxis claryana*) and California ditaxis (*D. serrata* var. *californica*). This memorandum serves as a supplement to the AMEC spring report and focuses on these two fall-blooming target species. Conservation status, habitat characteristics, and probability of occurrence for special status plants on the Desert Harvest site are summarized by AMEC (2011). Each of these species is ranked as a special status by California Department of Fish and Game (CDFG) or California Native Plant Society (CNPS). But none of the species documented on the site or targeted for these field surveys are listed, proposed for listing, or candidates for listing as threatened or endangered, nor are they managed by the Bureau of Land Management (BLM) as sensitive species.

The Desert Harvest site is located on public lands administered by BLM in unincorporated Riverside County, approximately 6 miles north of Desert Center, California (see Figure 1 in AMEC 2011). The Right of Way Application consists of two non-contiguous parcels (see Figure 1 in this memorandum). The eastern parcel is 1,057 acres and the western parcel is 270 acres. The AMEC surveys in spring 2010 covered only the larger, eastern parcel. The late-season surveys described in this memorandum covered both parcels. Follow-up spring season surveys on the smaller, western parcel are now underway. Upon completion of the 2011 spring field surveys, Aspen will provide a full report describing the methods and results of all botanical surveys at the Desert Harvest site.

The primary target species for these field surveys were glandular ditaxis and California ditaxis. In addition, all special status plants included in Appendix A of the AMEC (2011) report were considered secondary target species, though most of these would be unlikely to be found in flower during fall. Further, the distribution and abundance of many fall-flowering species in the California desert is incompletely documented in literature due to a historic emphasis on spring, rather than fall, field work. Yet a significant proportion of the flora is made up of annual species that germinate in response to summer rains, or perennial herbs that may flower at any time of year, depending on rainfall (Shreve and Wiggins 1964; Phillips and Comus 2000). Therefore, these late-season field surveys were conducted to find and identify as many species as possible, to maximize the likelihood that species not known from the area, or not included on a list of "target species" would be documented if they occur on the site. This approach to field work conforms to CDFG (2009) and BLM (2009) guidelines recommending "floristic" botanical surveys and provides the most thorough practicable botanical inventory of the Right of Way Application.



Average annual rainfall at the Eagle Mountain weather station, about 2.5 miles from the site, is 3.68 inches (WRCC 2011). On average, August is the wettest month, though WRCC reported no measureable rainfall at the station in August 2010. Average precipitation at the Eagle Mountain station during the months of July – October is 1.35 inches (37% of the average annual total). In 2010, there was a total of 1.23 inches of rainfall during this period, almost all of which fell during October.

METHODS

Before the field survey, we reviewed available literature to identify special status plants known from the project site and vicinity. Literature included California Natural Diversity Data Base (CDFG 2010, USGS Victory Pass, East of Victory Pass, Desert Center, Corn Spring, Coxcomb Mountains, Pinto Wells, Placer Canyon, Buzzard Spring, West of Palen Pass, Palen Lake and Sidewinder Well topographic quads), California Native Plant Society's *Online Inventory of Rare and Endangered Vascular Plants of California 8th ed.* (2010, for the same quads) and the preliminary results of AMEC's spring 2010 field surveys.

Field survey dates were based on known collection dates for glandular ditaxis and California ditaxis according to vouchered specimens (Consortium of California Herbaria 2010) and on 2010 late-season rainfall dates (primarily October). Aspen biologists Justin Wood and Dustin Ray conducted field surveys on the following dates: 21 Oct, 22 Oct, 1 Nov and 2 Nov 2010.

Field methods followed the “intuitive controlled survey” methods, described by BLM (2009). Wood and Ray carried out a complete survey of washes and any low-lying areas throughout the two parcels where runoff from summer rains would have been most concentrated, and a less intense survey of upland bajada and desert pavement surfaces. There were no summer annuals and only few flowering perennials on these upland surfaces, and field botanists concluded that there was little likelihood of finding special status plants or more common species not documented in washes or during earlier field surveys.

All plant species observed were identified in the field or collected for later identification. Plants were identified using keys, descriptions, and illustrations in Abrams (1923-1960), Shreve and Wiggins (1964), Munz (1974), Hickman (ed., 1993), applicable volumes of the Flora of North America (1993+), Baldwin et al. (eds., 2002), and other regional references. All species noted on the alignment are listed in the attached species list. In conformance with California Department of Fish and Game guidelines (2009), surveys were (a) conducted during flowering seasons for the late-flowering special status plants known from the area, (b) floristic in nature, (c) consistent with conservation ethics, (d) systematically covered all habitat types on the Right of Way, and (e) well documented, by this report and by voucher specimens to be deposited at Rancho Santa Ana Botanic Garden. Locations of special status plants will be reported to the CDFG Natural Diversity Data Base (copies of report forms attached).

RESULTS

Very few plants were in flower during the fall survey period. Rainfall during July – September has been well below average and summer annuals had evidently not germinated or persisted. The 1.17 inches of rain in October 2010 may have been too late to initiate germination among summer annual species.

Vegetation on the western site (not surveyed during spring 2010) is similar to that of the eastern site, with Creosote Bush-White Burr Sage Scrub (Sawyer et al. 2009) predominating. Intermixed with the Creosote Bush-White Burr Sage Scrub are areas of Smoke Tree Woodland. Both of

these vegetation types are described in AMEC (2011) and the Manual of California Vegetation (Sawyer et al. 2009).

Within the smaller, western project area, we located 15 individuals of one special status species, Emory's crucifixion thorn. It occurred primarily in a single stand (see Figure 1). Three other individuals were reported by AMEC (2011) in the eastern project area. All occurrences of Emory's crucifixion thorn reported by AMEC and Aspen are shown in Figure 1. Emory's crucifixion thorn is assigned to California Rare Plant Rank (CRPR, formerly CNPS List) 2.3 (rare, threatened, or endangered in California, but more common elsewhere). It is not managed by BLM as a sensitive species (BLM 2009).

We did not locate either target species, glandular ditaxis and California ditaxis on either of the two parcels, although we found two closely related species, common ditaxis (*Ditaxis neomexicana*) and Yuma ditaxis (*D. serrata* var. *serrata*) throughout the larger, eastern parcel. Neither of these species is ranked by BLM, USFWS, CDFG or CNPS as a special status species. Specimens of both species have been deposited in the Herbarium at Rancho Santa Ana Botanic Garden as permanent documentation.

During our field surveys of the eastern Right of Way parcel, we visited the location where Utah vine milkweed was mapped by AMEC. At this location, we found a closely related species, hairy milkweed (*Funastrum* [= *Sarcostemma*] *hirtellum*), but we did not find Utah vine milkweed. We identified the specimen by flower color and technical characters of flower structure (Baldwin et al. 2002). A specimen has been deposited in the Herbarium at Rancho Santa Ana Botanic Garden as permanent documentation. It is possible that both species occur at approximately the same location, or that the report of Utah vine milkweed may have been based on a misidentification of the similar hairy milkweed. Hairy milkweed has no special conservation status. Utah vine milkweed is assigned to CRPR 4.2 (limited distribution, "watch list"). It is not managed by BLM as a sensitive species (BLM 2009).

Please contact me any time to discuss or clarify any of the information in this memorandum.

Encl.

1. Literature Cited
2. Figure 1: Occurrences of Crucifixion Thorn within Desert Harvest proposed sites.
3. Appendix 1: Species List
4. Appendix 2: CNDDDB Search Results and Report Form

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Figure 1: Special-status plant occurrences within Desert Harvest Right of Way

Appendix 1: enXco Desert Harvest Proposed Solar Site Species List

Alien species indicated by asterisk, special status species indicated by two asterisks. This list includes only species observed on the site. Others may have been overlooked or unidentifiable due to season (amphibians are active during rains, reptiles during summer, some birds (and bats) migrate out of the area for summer or winter, some mammals hibernate, many plants are identifiable only in spring). Plants were identified using keys, descriptions, and illustrations in Abrams (1923-1960), Baldwin et al. (2002), and Munz (1974). Taxonomy and nomenclature generally follow Baldwin. Wildlife taxonomy and nomenclature generally follow Stebbins (2003) for amphibians and reptiles, AOU (1998) for birds, and Jones et al. (1992) for mammals. Specimens donated as vouchers to the UC

Latin Name	Common Name	Voucher
AMARANTHACEAE	AMARANTH FAMILY	
<i>Tidestromia oblongifolia</i> (<i>T. suffruticosa</i> var. <i>oblongifolia</i>)	Honeysweet	3038
ASCLEPIADACEAE	MILKWEED FAMILY	
<i>Asclepias erosa</i>	Desert milkweed	2999
<i>Asclepias subulata</i>	Rush milkweed	3029
<i>Sarcostemma hirtellum</i>	Rambling milkvine	3022
ASTERACEAE	ASTER FAMILY	
<i>Ambrosia dumosa</i>	White bursage, burrobrush	
<i>Bebbia juncea</i>	Sweetbush	3023
# <i>Chaenactis carphoclina</i>	Pincushion	
# <i>Chaenactis fremontii</i>	Fremont pincushion	
# <i>Chaenactis stevioides</i>	Broad-flowered pincushion	
<i>Encelia actoni</i>	Acton brittlebush	
<i>Encelia farinosa</i>	Brittlebush	
<i>Encelia frutescens</i>	Rayless encelia	3060
# <i>Gerea canescens</i>	Desert sunflower	
# <i>Hymenoclea salsola</i>	Cheesebush	
# <i>Malacothrix glabrata</i>	Desert dandelion	
# <i>Monoptilon bellioides</i>	Desert star	
<i>Palafoxia arida</i>	Spanish needles	3003
<i>Pectis papposa</i>	Chinchweed	2997
<i>Perityle emoryi</i>	Emory rock-daisy	2994
# <i>Psathrotes ramosissima</i>	Velvet rosettes, turtleback	
# <i>Rafinesquia neomexicana</i>	Desert chicory	
BORAGINACEAE	BORAGE FAMILY	
<i>Cryptantha angustifolia</i>	Narrowleaf cryptantha	
<i>Cryptantha barbiger</i>	Bearded cryptantha	
# <i>Cryptantha dumetorum</i>	Twining cryptantha	
# <i>Pectocarya platycarpa</i>	Broad-fruited comb-bur	
# <i>Pectocarya recurvata</i>	Recurved pectocarya	
# <i>Tiquilia plicata</i> (<i>Coldenia plicata</i>)	Plicate tiquilia	
BRASSICACEAE	MUSTARD FAMILY	
* <i>Brassica tournefortii</i>	Sahara mustard, wild turnip	
<i>Lepidium</i> spp.	Unid. pepper-grass	
# <i>Lepidium lasiocarpum</i> (?)	Sand peppergrass	

denotes species found during spring 2010 Amec surveys.

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CACTACEAE		CACTUS FAMILY	
	<i>Ferocactus cylindraceus</i>		California barrel cactus
	<i>Opuntia basilaris</i> v. <i>basilaris</i>		Beavertail cactus
	<i>Cylindropuntia echinocarpa</i>		Silver cholla
	<i>Cylindropuntia ramosissima</i>		Pencil cholla
#	<i>Achyronychia cooperi</i>		Onyx flower
#	<i>Chenopodium</i> sp.		Unidentified goosefoot
CUCURBITACEAE		GOURD FAMILY	
	<i>Brandegea bigelovii</i>		Brandegea
EUPHORBIACEAE		SPURGE FAMILY	
#	<i>Chamaesyce albomarginata</i> (<i>Euphorbia albomarginata</i>)		Rattlesnake spurge
	<i>Chamaesyce micromera</i>	Sonoran sandmat	3006
	<i>Chamaesyce polycarpa</i>	Sand mat	3004
	<i>Croton californicus</i>	California croton	3024
#	<i>Ditaxis lanceolata</i>	Narrow-leaved ditaxis	
	<i>Ditaxis neomexicana</i>	Common ditaxis	3030
	<i>Ditaxis serrata</i>	Yuma ditaxis	3000
#	<i>Stillingia linearifolia</i>	Linear-leaved stillingia	
	<i>Stillingia spinulosa</i>	Annual stillingia	2993
FABACEAE		PEA FAMILY	
	<i>Acacia greggii</i>	Catclaw acacia	
	<i>Cercidium floridum</i>	Blue palo verde	3059
	<i>Dalea mollis</i>	Silk dalea	3027
#	<i>Dalea mollissima</i>	Rust dalea	
#	<i>Lupinus arizonicus</i>	Arizona lupine	
#	<i>Lupinus</i> sp.	Unid. annual lupine	
#	<i>Marina parryi</i>	Parry dalea	
	<i>Olnya tesota</i>	Desert ironwood	
#	<i>Parkinsonia florida</i>	Blue palo verde	
	<i>Psoralea arguta</i> (<i>Dalea emoryi</i>)	Emory indigo-bush, dye-weed	3002
	<i>Psoralea schottii</i> (<i>Dalea schottii</i>)	Indigo-bush	
#	<i>Fouquieria splendens</i>	Ocotillo	
KRAMERIACEAE		KRAMERIA FAMILY	
	<i>Krameria grayii</i>	White rhatany	3063
LAMIACEAE		MINT FAMILY	
	<i>Hyptis emoryi</i>	Desert lavender	3062
#	<i>Eremalche rotundifolia</i>	Desert fivespot	
MARTYNIACEAE		UNICORN PLANT FAMILY	
	<i>Proboscidea althaeifolia</i>	Unicorn plant	
NYCTAGINACEAE		FOUR O'CLOCK FAMILY	
#	<i>Abronia villosa</i> var. <i>villosa</i>	Sand verbena	
	<i>Allionia incarnata</i>	Trailing windmills	2992
ONAGRACEAE		EVENING PRIMROSE FAMILY	
	<i>Camissonia boothii</i>	Desert primrose	

denotes species found during spring 2010 Amec surveys.

Appendix 1: enXco Desert Harvest Proposed Solar Site Species List

<i>ssp. desertorum</i>		
<i>Camissonia claviformis</i>	Clavate evening primrose	
# <i>Camissonia sp.</i>	Unidentified primrose	
PAPAVERACEAE	POPPY FAMILY	
# <i>Eschscholzia minutiflora</i>	Small-flowered poppy	
PLANTAGINACEAE	PLANTAIN FAMILY	
<i>Plantago ovata</i>	Desert plantain	
POLEMONIACEAE	PHLOX FAMILY	
# <i>Gilia latifolia</i>	Broad-leaved gilia	
# <i>Loeseliastrum schottii</i>	Schott's langloisia	
POLYGONACEAE	BUCKWHEAT FAMILY	
# <i>Chorizanthe brevicornu</i>	Brittle spine-flower	
# <i>Chorizanthe corrugata</i>	Wrinkled spineflower	
<i>Chorizanthe rigida</i>	Rigid spine-flower	3061
<i>Eriogonum deflexum</i>	Skeleton weed	2990
<i>Eriogonum pusillum</i>	Puny buckwheat	
# <i>Eriogonum reniforme</i>	Kidney-leaved buckwheat	
PORTULACACEAE	PURSLANE FAMILY	
<i>Calyptridium monandrum</i>	Common calyptridium	
# <i>Oligomeris linifolia</i>	Narrowleaf oligomeris	
SIMAROUBACEAE		
** <i>Castela emoryi</i>	Crucifixion thorn	2991
SOLANACEAE	NIGHTSHADE FAMILY	
<i>Datura discolor</i>	Jimsonweed, desert thorn-apple	3058
<i>Physalis crassifolia</i>	Thick-leaf ground cherry	2998
ZYGOPHYLLACEAE	CALTROP FAMILY	
# <i>Fagonia laevis</i>	Smooth-stem fagonia	
# <i>Fagonia pachyacantha</i>	Glandular fagonia	
<i>Kallstroemia californica</i>	California caltrop	3026
<i>Larrea tridentata</i>	Creosote bush	
# <i>Tribulus terrestris</i>	Puncture vine	
ARECACEAE	PALM FAMILY	
# <i>Phoenix dactylifera</i>	Date palm	
LILIACEAE	LILY FAMILY	
# <i>Calochortus sp.</i>	Unid. Mariposa lily	
# <i>Hesperocallis undulata</i>	Desert lily	
<i>Zigadenus brevibracteatus</i>	Desert zigadene	
POACEAE	GRASS FAMILY	
<i>Aristida californica</i>	California three-awn	2995
<i>Aristida purpurea</i>	Three-awn grass	
<i>Bouteloua aristidoides</i>	Needle grama	2996
<i>Pleuraphis rigida (Hilaria rigida)</i>	Big galleta	
* <i>Schismus barbatus</i>	Mediterranean schismus	

denotes species found during spring 2010 Amec surveys.

Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1 <i>Ammoselinum giganteum</i> desert sand-parsley	PDAPI05020			G2G3	SH	2.3
2 <i>Astragalus insularis</i> var. <i>harwoodii</i> Harwood's milk-vetch	PDFAB0F491			G5T3	S2.2?	2.2
3 <i>Ayenia compacta</i> California ayenia	PDSTE01020			G4	S3?	2.3
4 <i>Castela emoryi</i> Emory's crucifixion-thorn	PDSIM03030			G2G3	S2S3	2.3
5 <i>Colubrina californica</i> Las Animas colubrina	PDRHA05030			G4	S2S3.3	2.3
6 <i>Coryphantha alversonii</i> Alverson's foxtail cactus	PDCAC0X060			G3	S3.2	4.3
7 <i>Ditaxis claryana</i> glandular ditaxis	PDEUP080L0			G4G5	S1	2.2
8 <i>Ditaxis serrata</i> var. <i>californica</i> California ditaxis	PDEUP08050			G5T2T3	S2	3.2
9 <i>Eriastrum harwoodii</i> Harwood's eriastrum	PDPLM030B1			G2	S2	1B.2
10 <i>Grusonia parishii</i> Parish's club-cholla	PDCAC0D2H0			G3G4	S2	2.2
11 <i>Koeberlinia spinosa</i> ssp. <i>tenuispina</i> slender-spined all-thorn	PDCPP05012			G4T4	S2.2	2.2
12 <i>Matelea parvifolia</i> spear-leaf matelea	PDASC0A0J0			G5?	S2.2	2.3
13 <i>Mentzelia puberula</i> Darlington's blazing star	PDLOA031F0			G4	S2	2.2
14 <i>Salvia greatae</i> Orocopia sage	PDLAM1S0P0			G2	S2	1B.3
15 <i>Selaginella eremophila</i> desert spike-moss	PPSEL010G0			G4	S2.2?	2.2
16 <i>Senna covesii</i> Cove's cassia	PDFAB491X0			G5?	S1	2.2
17 <i>Stylocline sonorensis</i> mesquite neststraw	PDAST8Y060			G3G5	SX	1A
18 <i>Teucrium cubense</i> ssp. <i>depressum</i> dwarf germander	PDLAM20032			G4G5T3T4	S2	2.2
19 <i>Wislizenia refracta</i> ssp. <i>palmeri</i> Palmer's jackass clover	PDCPP09015			G5T2T4	S2?	2.2

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811

Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

For Office Use Only

Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 10/21/2010

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Castela emoryi*

Common Name: crucifixion thorn

Species Found? ☒ Yes ☐ No If not, why? _____
Total No. Individuals 10 Subsequent Visit? ☐ yes ☒ no
Is this an existing NDDDB occurrence? ☐ no ☒ unk.
Yes, Occ. # _____
Collection? If yes: 2991 RSA-POM
Number Museum / Herbarium

Reporter: Justin M. Wood
Address: 201 North First Ave. No. 102
Upland, CA 91786
E-mail Address: Jwood@aspenerg.com
Phone: (909) 568-5235

Plant Information

Phenology: 75% 0% 25%
vegetative flowering fruiting

Animal Information

adults # juveniles # larvae # egg masses # unknown
☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Riverside Landowner / Mgr.: Private
Quad Name: Victory Pass Elevation: 205 m
T 4S R 15E Sec 27, SE ¼ of _____ ¼, Meridian: H ☐ M ☐ S ☐ Source of Coordinates (GPS, topo. map & type): GPS
T _____ R _____ Sec _____, _____ ¼ of _____ ¼, Meridian: H ☐ M ☐ S ☐ GPS Make & Model Garmin 60CSx
DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☒ Horizontal Accuracy ±15ft meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ OR Geographic (Latitude & Longitude) ☒
Coordinates: 33°47'26.4"N 115°24'13.2"W

Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope):

Creosote scrub on packed sandy soils.

Other rare taxa seen at THIS site on THIS date:
(separate form preferred)

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Date farm, private residences

Visible disturbances:

Threats: In vicinity of proposed solar field

Comments:

Determination: (check one or more, and fill in blanks)

- ☒ Keyed (cite reference): Hickman 1993
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: (check one or more) Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

Appendix C.6

Biological Resources Technical Report



0 2 4 Miles

Figure 3.3-1

Project and Vicinity

Attachment 2 – Figures

REFERENCES:

- Bureau of Land Management (BLM). 2011a. Desert Sunlight Solar Farm Project: California Desert Conservation Area plan amendment and final environmental impact statement. BLM Palm Springs South Coast Field Office, Palm Springs, California.
- Bureau of Land Management (BLM). 2011b. Record of Decision – Desert Sunlight Solar Farm Project and Amendment to the California Desert Conservation Area Land Use Management Plan, Riverside County, California. Palm Springs South Coast Field Office Palm Springs, California. (August).
- Environmental Laboratory. 1987. Corps of Engineers Wetland Delineation Manual. Technical Report Y 87-1. U.S. Army Engineer Waterways Experiment Station. Vicksburg, MS.
- Ironwood Consulting Inc. and Huffman-Broadway Group, Inc. 2010. *Investigation of the Presence of Wetlands and Other Waters of the United States Desert Sunlight Solar Farm Project, Riverside County, California.. Prepared for Desert Sunlight Holdings, LLC Oakland, CA. June. 39 pp. Exhibits.*
- U.S. Army Corps of Engineers. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Attachment 1 - References

absence of surface hydrologic connection applies to all the ephemeral desert dry washes on both project sites.

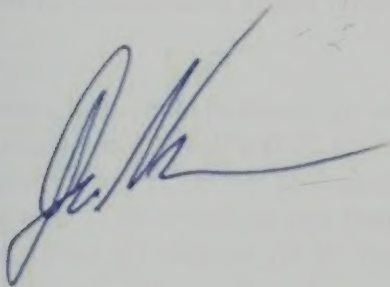
Aspen has reviewed the Desert Sunlight FEIS and has completed a field survey of waters on the DHSP site. Based on our review and field investigations, Aspen believes that the analysis of the Desert Sunlight site is wholly applicable to the DHSP site. The ephemeral desert dry washes mapped within the DHSP are non-jurisdictional under the Section 404 of the Clean Water Act (Figure 3.3-3, Attachment 2), and there are no wetlands meeting the criteria of the 1987 USACE Wetland Delineation Manual and the 2008 USACE Arid West Region Supplement (Version 2.0).

We understand that the Corps' evaluation process for determining whether or not a Department of the Army permit is needed involves two tests. If both tests are met, then a permit is required. The first test determines whether or not the proposed project is located in a water of the United States (i.e., it is within the Corps' geographic jurisdiction). The second test determines whether or not the proposed project is a regulated activity under Section 10 of the River and Harbor Act or Section 404 of the Clean Water Act. As part of the evaluation process, pertaining to the first test only, we believe that there are no waters of the United States on the project site. All the desert washes we have identified on the site are intrastate isolated waters with no apparent interstate or foreign commerce connection.

Aspen is requesting that the Corps review the information and attachments herein, and provide a written jurisdictional determination for the DHSP site.

If you have any questions or concerns, please call me at (818) 338-6715.

Sincerely,



Jared Varonin
Biologist/Ecologist
Certified Fisheries Professional
Aspen Environmental Group

cc. Ian Black, enXco
Lynnette Elser, Bureau of Land Management
Ken Baez, Riverside County Transportation and Resource Management Agency
Leslie McNair, California Department of Fish and Game
Jay Mirpour, California Regional Water Quality Control Board Colorado River Basin Region - 7

enc. Attachment 1 – References
Attachment 2 – Figures
Attachment 3 – Preliminary Jurisdictional Determination Form





5020 Chesebro Road, Suite 200, Agoura Hills, CA 91301
Tel. 818-597-3407, Fax 818-597-8001, www.aspeneg.com

January 24, 2012

Mr. Daniel Swenson
United States Army Corps of Engineers
Los Angeles District/Regulatory Division
915 Wilshire Blvd.
Los Angeles, CA 90017-3401

Subject: Request for jurisdictional determination, Desert Harvest Solar Project, Desert Center, Riverside County, California

Dear Mr. Swenson,

Aspen Environmental Group (Aspen) is contracted to the Bureau of Land Management (BLM) and enXco to prepare an Environmental Impact Statement (EIS) for enXco's proposed the Desert Harvest Solar Project (DHSP). The proposed project site is in Riverside County, California, in the upper Chuckwalla Valley. It is approximately 5 miles north of the rural community of Desert Center. Attachment 2 of this letter presents Draft EIS Figures 3.3-1 (project and vicinity map) and 3.3-3 (state jurisdictional streambeds).

Project components would include a 150 megawatt photovoltaic solar generation facility, operations and maintenance facility, electrical collection system, overhead collection lines, meteorological station(s), an on-site substation and switchyard, and a 6 mile transmission line to interconnect to the regional grid. The total project area would be 1,208 acres.

A similar, larger solar project (Desert Sunlight) has been approved by the BLM and now under construction immediately north of the proposed DHSP site (see Attachment 2). The Final EIS and Record of Decision for the Desert Sunlight project (BLM 2011a; 2011b) indicate that the US Army Corps of Engineers (Corps) determined that waters on the Desert Sunlight project site do not meet criteria as federally jurisdictional Waters of the U.S. That conclusion was based on an analysis by Ironwood Consulting and Huffmann Broadway Group (2010).

The DHSP and Desert Sunlight sites are both within the closed basin that drains to Ford Dry Lake. Ephemeral channels flow generally from the west and northwest toward the east and southeast across both project areas, toward Pinto Wash. Channels on both project sites are usually dry, but channel morphology indicates that surface flow occurs during infrequent heavy rain storms. Most of the ephemeral desert dry washes on the DHSP site are common to both project sites (i.e., flow originates upstream from the Desert Sunlight site, crosses it, then crosses the DHSP site, and continues toward Pinto Wash). The remainder of the ephemeral washes on the DHSP site are also tributaries to the same system.

There is no surface hydrologic connection between Pinto Wash and Ford Dry Lake due to intervening sand dunes, as shown on USGS 7.5-minute series topographic quadrangles for the area (i.e., East of Victory Pass [1987 Provisional Edition]; Palen Lake [1983 Provisional Edition]; Corn Springs [1986 Provisional Edition]; and Sidewinder Well [1983 Provisional Edition]). In addition, the USGS 1:25K high resolution National Hydrography Dataset (NHD) shows this lack of surface hydrologic connection. The

Appendix C.11

Request to USACE for Jurisdictional Determination

Appendix D
Example California BLM Pesticide Application Records Form

1. General Information

- a. Project Name: _____
- b. Operator: _____
- c. Pesticide Use Proposal Number: _____
- d. Reference Number: _____

2. Name of Applicator or Employee(s) Applying the Pesticide:

3. Date(s) of Application: _____
(MONTH, DAY, YEAR)

4. Time Frame of Application: _____

5. Location of Application: T _____, R _____, and Sec. _____
County _____

6. Type of Equipment Used: _____

7. Pesticide(s) Used: _____

Company or Manufacturer's Name: _____

Trade Name: _____

Type of Formulation: Liquid ___/ Granular ___/

8. Rate of Application Used:

- a. Active Ingredient per Acre _____
- b. Volume of Formulation per Acre _____

9. Treatment Area

- a. Actual Area Treated: _____
- b. Total Project Area: _____

10. Primary Pest(s) Involved: _____

11. Stage of Pest Development: _____

12. Site Treated: ___/ Native Vegetation ___/ Seeded Vegetation ___/ Other

13. Weather Conditions:

- a. Wind velocity: _____ b. Wind direction _____ c. Temperature _____

14. Monitoring Record (IF INSUFFICIENT SPACE-CONTINUE ON BACK):

Appendix D

Example California BLM Pesticide Application Records Form

1. Name of Applicant: _____

2. Name of Landowner: _____

3. Name of Pesticide: _____

4. Location of Application: _____

5. Type of Pesticide: _____

6. Application Date: _____

7. Application Time: _____

8. Application Method: _____

9. Application Rate: _____

10. Application Area: _____

11. Application Results: _____

12. Application Comments: _____

13. Application Status: _____

14. Application Date: _____

15. Application Time: _____

16. Application Method: _____

17. Application Rate: _____

18. Application Area: _____

19. Application Results: _____

20. Application Comments: _____

21. Application Status: _____

22. Application Date: _____

23. Application Time: _____

Example California BLM Pesticide Use Proposal

ESTIMATED ACRES

V. SENSITIVE ASPECTS AND PRECAUTIONS: (Describe sensitive areas [e.g., marsh, endangered, threatened, candidate and sensitive species habitat] and distance to treatment site. List measures taken to avoid impact to sensitive areas).

VI. NON-TARGET VEGETATION: (Describe the impacts, cumulative impacts, and mitigations to non-target vegetation that will be lost as a result of this chemical application).

VII. INTEGRATED PEST MANAGEMENT: (Describe how this chemical application fits into your overall integrated pest management program for the treatment area.)

Originator: _____
Company Name: _____
Phone: _____

Date: _____

Certified Pesticide Applicator:

(Signature)

Date: _____

Field Office Pesticide/Noxious Weed Coordinator

(Signature)

Date: _____

APPROVALS:

Date: _____

BLM Assistant Field Manager
Renewable Resources
(Signature)

APPROVALS (State Office Use Only):

Date: _____

BLM State Pesticide Coordinator
(Signature)

Date: _____

Deputy State Director, Natural Resources,
Lands and Planning
(Signature)

_ CONCUR OR APPROVED
_ NOT CONCUR OR DISAPPROVED
_ CONCUR OR APPROVED WITH MODIFICATIONS

Appendix C
Example California BLM Pesticide Use Proposal

PROPOSAL NUMBER:
REFERENCE NUMBER:

FIELD OFFICE _____ COUNTY _____

LOCATION:

DURATION OF PROPOSAL:

I. PESTICIDE APPLICATION (including mixtures and surfactants):

	Trade Names	Common Names	EPA Registration No.	Manufacturer	Formulations (Liquid or Granular)	Method of Application
1						
2						
3						

MAXIMUM RATE OF APPLICATION:	
USE UNIT ON LABEL:	POUNDS ACID EQUIVALENT/ACRE:
1.	1.
2.	2.

INTENDED RATE OF APPLICATION:

APPLICATION DATES:

NUMBER OF APPLICATIONS:

II. PEST (List specific pest(s) and reason(s) for application):

III. MAJOR DESIRED PLANT SPECIES PRESENT:

IV. TREATMENT SITE: (Describe land type or use, size, stage of growth of target species, slope and soil type).

Appendix C

Example California BLM Pesticide Use Proposal

Product Name	Active Ingredient	Use Description	Application Method	Application Frequency	Application Date

Pesticide Use Application	
1. Pesticide Name	2. Pesticide Use Description

3. Pesticide Use Description	4. Pesticide Use Description

5. Pesticide Use Description	6. Pesticide Use Description

7. Pesticide Use Description	8. Pesticide Use Description

[illegible]

Adjuvant Class	Adjuvant Type	Trade Name	Munufacturer	Comments
Fertilizer-based	Nitrogen-based - cont.	Bronc Total	Wilbur-Ellis	
cont.		Cayuse Plus	Wilbur-Ellis	CA Reg. No. 2935-50171
Special Purpose or Utility	Buffering Agent	Buffers P.S.	Helena	CA Reg. No. 5905-50062-ZA
		Spray-Aide	Miller Chem. & Fert. Corp.	CA Reg. No. 72-50006-AA
		Oblique	Red River Specialties, Inc.	
		Tri-Fol	Wilbur-Ellis	CA Reg. No. 2935-50152
	Colorants	Hi-Light	Becker-Underwood	
		Hi-Light WSP	Becker-Underwood	
		Marker Dye	Loveland Products Inc.	
		BullsEye	Milliken Chemical	
		Signal	Precision	
Special Purpose or Utility - cont.	Compatibility/ Suspension Agent	E Z MIX	Loveland Products Inc.	CA Reg. No. 36208-50006
		Support	Loveland Products Inc.	WA Reg. No. 34704-04011
		Blendex VHC	Setre (Helena)	
	Deposition Aid	Cygnat Plus	Brewer International	CA Reg. No. 1051114-50001
		Poly Control 2	Brewer International	
		CWC Sharpshooter	CWC Chemical, Inc.	
		ProMate Impel	Helena	
		Pointblank	Helena	CA Reg. No. 52467-50008-AA-5905
		Strike Zone DF	Helena	CA Reg. No. 5905-50084-AA
		Compadre	Loveland Products Inc.	CA Reg. No. 34704-50050
				WA Reg. No. 34704-06004
		Intac Plus	Loveland Products Inc.	
		Liberate	Loveland Products Inc.	CA Reg. No. 34704-50030-AA
				WA Reg. No. 34704-04008
		Reign	Loveland Products Inc.	CA Reg. No. 34704-50045
				WA Reg. No. 34704-05010
		Weather Gard	Loveland Products Inc.	CA Reg. No. 34704-50042-AA
		Mist-Control	Miller Chem. & Fert. Corp.	CA Reg. No. 72-50011-AA
		Secure Ultra	Red River Specialties, Inc.	
		Sta Put	Setre (Helena)	CA Reg. No. 5905-50068-AA
		Agripharm Drift Control	Walco International	
		Bivert	Wilbur-Ellis	CA Reg. No. 2935-50163
		Coverage G-20	Wilbur-Ellis	
		EDT Concentrate	Wilbur-Ellis	
	Defoaming Agent	Defoamer	Brewer International	
		Fighter-F 10	Loveland Products Inc.	
		Fighter-F Dry	Loveland Products Inc.	
		Foam Fighter	Miller Chem. & Fert. Corp.	CA Reg. No. 72-50005-AA
		Foam Buster	Setre (Helena)	CA Reg. No. 5905-50072-AA
		Cornbelt Defoamer	Van Diest Supply Co	
		No Foam	Wilbur-Ellis	CA Reg. No. 2935-50136
	Diluent/Deposition Agent	Improved JLB Oil Plus	Brewer International	
		JLB Oil Plus	Brewer International	

Adjuvant Class	Adjuvant Type	Trade Name	Munufacturer	Comments
	Silicone-based - cont.	Kinetic	Setre (Helena)	CA Reg. No. 5905-50087-AA
		Freeway	Loveland Products Inc.	CA Reg. No. 34704-50031
				WA Reg. No. 34704-04005
		Phase	Loveland Products Inc.	CA Reg. No. 34704-50037-AA
		Phase II	Loveland Products Inc.	
		Silwet L-77	Loveland Products Inc.	CA Reg. No. 34704-50043
		Sun Spreader	Red River Specialties, Inc.	
		Sylgard 309	Wilbur-Ellis	CA Reg. No. 2935-50161
		Syl-Tac	Wilbur-Ellis	CA Reg. No. 2935-50167
Oil-based	Crop Oil Concentrate	Brewer 83-17	Brewer International	
		Majestic	Crown (Estes Incorporated)	
		Agri-Dex	Helena	CA # 5905-50094-AA
		Crop Oil Concentrate	Helena	CA Reg. No. 5905-50085-AA
		Crop Oil Concentrate	Loveland Products Inc.	
		Herbimax	Loveland Products Inc.	CA Reg. No. 34704-50032-AA
				WA Reg. No. 34704-04006
		Red River Forestry Oil	Red River Specialties, Inc.	
		R.O.C. Rigo Oil Conc.	Wilbur-Ellis	
		Mor-Act	Wilbur-Ellis	CA Reg. No. 2935-50098
	Methylated Seed Oil	SunEnergy	Brewer International	
		Sun Wet	Brewer International	
		Methylated Spray Oil Conc.	Helena	
		MSO Concentrate	Loveland Products Inc.	CA Reg. No. 34704-50029-AA
		Red River Supreme	Red River Specialties, Inc.	
		Sunburn	Red River Specialties, Inc.	
		Sunset	Red River Specialties, Inc.	
		Hasten	Wilbur-Ellis	CA Reg. No. 2935-50160
				WA Reg. No. 2935-02004
		Super Spread MSO	Wilbur-Ellis	
	Methylated Seed Oil + Organosilicone	Inergy	Crown (Estes Incorporated)	
	Vegetable Oil	Noble	Estes Incorporated	
		Amigo	Loveland Products Inc.	CA Reg. No. 34704-50028-AA
				WA Reg. No. 34704-04002
		Competitor	Wilbur-Ellis	CA Reg. No. 2935-50173
				WA Reg. No. AW-2935-04001
Fertilizer-based	Nitrogen-based	Quest	Setre (Helena)	CA Reg. No. 5905-50076-AA
		Dispatch	Loveland Products Inc.	
		Dispatch 111	Loveland Products Inc.	
		Dispatch 2N	Loveland Products Inc.	
		Dispatch AMS	Loveland Products Inc.	
		Flame	Loveland Products Inc.	
		Bronc	Wilbur-Ellis	
		Bronc Max	Wilbur-Ellis	
		Bronc Max EDT	Wilbur-Ellis	
		Bronc Plus Dry EDT	Wilbur-Ellis	WA Reg. No.2935-03002

Adjuvants Approved for Use on BLM Administered Lands

Update: October 10, 2008

Adjuvant Class	Adjuvant Type	Trade Name	Manufacturer	Comments
Surfactant	Non-ionic	Agrisolutions Preference	Agriance, LLC.	WA Reg. No. 1381-50011
		Aqufact	Aqumix, Inc.	
		Brewer 90-10	Brewer International	
		Baron	Crown (Estes Incorporated)	
		N.I.S. 80	Estes Incorporated	
		Spec 90/10	Helena	
		Optima	Helena	CA Reg. No. 5905-50075-AA
		Induce	Setre (Helena)	CA Reg. No. 5905-50066-AA
		Actamaster Spray Adjuvant	Loveland Products Inc.	WA Reg. No. 34704-50006
		Actamaster Soluble Spray Adj.	Loveland Products Inc.	WA Reg. No. 34704-50001
		Activator 90	Loveland Products Inc.	CA Reg. No. 34704-50034-AA
		LI-700	Loveland Products Inc.	CA Reg. No. 34704-50035
				WA Reg. No. AW36208-70004
		Spreader 90	Loveland Products Inc.	WA Reg. No. 34704-05002-AA
		UAP Surfactant 80/20	Loveland Products Inc.	
		X-77	Loveland Products Inc.	CA Reg. No. 34704-50044
		Red River 90	Red River Specialties, Inc.	
		Cornbelt Premier 90	Van Diest Supply Co.	
		Spray Activator 85	Van Diest Supply Co.	
		Agripharm 90	Walco International	
		R-900	Wilbur-Ellis	
		Super Spread 90	Wilbur-Ellis	WA Reg. No. AW-2935-70016
		Super Spread 7000	Wilbur-Ellis	CA Reg. No. 2935-50170
				WA Reg. No. AW-2935-0002
		Agrisolutions Preference	Winfield Solutions, LLC	WA Reg. No. 1381-50011
	Spreader/Sticker	Agri-Trend Spreader	Agri-Trend	
		TopFilm	Biosorb, Inc.	
		Bind-It	Estes Incorporated	
		Surf-King PLUS	Crown (Estes Incorporated)	
		CWC 90	CWC Chemical, Inc.	
		Cohere	Helena	CA Reg. No. 5905-50083-A
		Attach	Loveland Products Inc.	CA Reg. No. 34704-50026
		Bond	Loveland Products Inc.	CA Reg. No. 36208-50005
		Tactic	Loveland Products Inc.	CA Reg. No. 34704-50041-AA
		Nu-Film-IR	Miller Chem. & Fert. Corp.	
		Lastick	Setre (Helena)	
		Insist 90	Wilbur-Ellis	
		R-56	Wilbur-Ellis	CA Reg. No. 2935-50144
	Silicone-based	SilEnergy	Brewer International	
		Silnet 200	Brewer International	
		Bind-It MAX	Estes Incorporated	
		Thoroughbred	Estes Incorporated	
		Aero Dyne-Amic	Helena	CA Reg. No. 5905-50080-AA
		Dyne-Amic	Helena	CA Reg. No. 5095-50071-AA

	STATES WITH APPROVAL BASED UPON CURRENT				
ACTIVE	EIS/ROD & COURT			EPA REG.	CA
INGREDIENT	INJUNCTIONS	TRADE NAME	MANUFACTURER	NUMBER	REG. **
Triclopyr	AK, AZ, CA, CO, ID, MT, ND,	Triclopyr 4EC	Alligare, LLC	72167-53-74477	Y
	NE, NM, NV, OK, SD, TX, UT	Triclopyr 3	Alligare, LLC	81927-13	Y
	WA, WY	Triclopyr 4	Alligare, LLC	81927-11	Y
		Element 3A	Dow AgroSciences	62719-37	Y
		Element 4	Dow AgroSciences	62719-40	Y
		Forestry Garlon XRT	Dow AgroSciences	62719-553	Y
		Garlon 3A	Dow AgroSciences	62719-37	Y
		Garlon 4	Dow AgroSciences	62719-40	Y
		Garlon 4 Ultra	Dow AgroSciences	62719-527	Y
		Remedy	Dow AgroSciences	62719-70	Y
		Remedy Ultra	Dow AgroSciences	62719-552	Y
		Pathfinder II	Dow AgroSciences	62719-176	Y
		Tahoe 3A	Nufarm Americas Inc.	228-384	Y
		Tahoe 3A	Nufarm Americas Inc.	228-518	Y
		Renovate 3	SePRO Corporation	62719-37-67690	Y
		Renovate OTF	SePRO Corporation	67690-42	Y
		Ecotriclopyr 3 SL	Vegetation Man., LLC	72167-49-74477	N
		Triclopyr 3 SL	Vegetation Man., LLC	72167-53-74477	N
Triclopyr + 2,4-D	AK, AZ, CA, CO, ID, MT, ND,	Everett	Alligare, LLC	81927-29	Y
	NE, NM, NV, OK, SD, TX, UT,	Crossbow	Dow AgroSciences	62719-260	Y
	WA, WY				
Triclopyr + Clopyralid	AK, AZ, CA, CO, ID, MT, ND,	Prescott Herbicide	Alligare, LLC	81927-30	Y
	NE, NM, NV, OK, SD, TX, UT,	Redeem R&P	Dow AgroSciences	62719-337	Y
	WA, WY				
* Refer to the complete label prior to considering the use of any herbicide formulation. Label changes can impact the intended use through, such things as, creation or elimination of Special Local Need (SLN) or 24 (c) registrations, changes in application sites, rates and timing of application, county restrictions, etc.					
** Just because a herbicide has a Federal registration, and is approved under the current EIS, it may or may not be registered for use in California. This column identifies those formulations for which there is a California registration.					

	STATES WITH APPROVAL BASED UPON CURRENT				
ACTIVE	EIS/ROD & COURT			EPA REG.	CA
INGREDIENT	INJUNCTIONS	TRADE NAME	MANUFACTURER	NUMBER	REG. **
Sulfometuron methyl	AK, AZ, CA, CO, ID, MT, ND,	SFM 75	Alligare, LLC	81927-26	Y
	NE, NM, NV, OK, SD, TX, UT	Oust DF	DuPont	352-401	N
	WA, WY	Oust XP	DuPont	352-601	Y
		SFM E-Pro 75EG	Etigra, LLC	79676-16	Y
		Spyder	Nufarm Americas Inc.	228-408	Y
		SFM 75	Vegetation Man., L.L.C.	72167-11-74477	Y
NOTE: In accordance with the Record of Decision for the <i>Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (PEIS)</i> , the aerial application of these herbicides is prohibited.					
Sulfometuron methyl + Chlorsulfuron	AK, AZ, CA, CO, ID, MT, ND,	Landmark XP	DuPont	352-645	Y
	NE, NM, NV, OK, SD, TX, UT				
	WA, WY				
NOTE: In accordance with the Record of Decision for the <i>Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (PEIS)</i> , the aerial application of this herbicide is prohibited.					
Sulfometuron methyl + Metsulfuron methyl	AK, AZ, CA, CO, ID, MT, ND,	Oust Extra	DuPont	352-622	N
	NE, NM, NV, OK, SD, TX, UT				
	WA, WY				
NOTE: In accordance with the Record of Decision for the <i>Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (PEIS)</i> , the aerial application of this herbicide is prohibited.					
Tebuthiuron	AZ, CA, CO, ID, MT, ND, NE,	Spike 20P	Dow AgroSciences	62719-121	Y
	NM, NV, OK, SD, TX, UT, WA,	Spike 80DF	Dow AgroSciences	62719-107	Y
	WY	SpraKil S-5 Granules	SSI Maxim Co., Inc.	34913-10	Y
Tebuthiuron + Diuron	AZ, CA, CO, ID, MT, ND, NE,	SpraKil SK-13 Granular	SSI Maxim Co., Inc.	34913-15	Y
	NM, NV, OK, SD, TX, UT, WA,	SpraKil SK-26 Granular	SSI Maxim Co., Inc.	34913-16	Y
	WY				

	STATES WITH APPROVAL				
	BASED UPON CURRENT				
ACTIVE	EIS/ROD & COURT			EPA REG.	CA
INGREDIENT	INJUNCTIONS	TRADE NAME	MANUFACTURER	NUMBER	REG. **
Metsulfuron methyl +	AK, AZ, CO, ID, MT, ND, NE,	Cimarron Extra	DuPont	352-669	N
Chlorsulfuron	NM, NV, OK, SD, TX, UT, WA,	Cimarron Plus	DuPont	352-670	N
	WY				
Metsulfuron methyl +	AK, AZ, CO, ID, MT, ND, NE, NM	Cimarron MAX	DuPont	352-615	N
Dicamba + 2,4-D	NV, OK, SD, TX, UT, WA, WY				
Picloram	AZ, CO, ID, MT, ND, NE, NM,	Triumph K	Albaugh, Inc.	42750-81	N
	NV, OK, OR, SD, TX, UT, WA,	Triumph 22K	Albaugh, Inc.	42750-79	N
	WY	Picloram K	Alligare, LLC	42750-81-81927	N
		Picloram K	Alligare, LLC	81927-17	N
		Picloram 22K	Alligare, LLC	42750-79-81927	N
		Picloram 22K	Alligare, LLC	81927-18	N
		Grazon PC	Dow AgroSciences	62719-181	N
		OutPost 22K	Dow AgroSciences	62719-6	N
		Tordon K	Dow AgroSciences	62719-17	N
		Tordon 22K	Dow AgroSciences	62719-6	N
Picloram +	AZ, CO, ID, MT, ND, NE, NM,	GunSlinger	Albaugh, Inc.	42750-80	N
2,4-D	NV, OK, OR, SD, TX, UT, WA,	Picloram + D	Alligare, LLC	42750-80-81927	N
	WY	Picloram + D	Alligare, LLC	81927-16	N
		Tordon 101M	Dow AgroSciences	62719-5	N
		Tordon 101 R Forestry	Dow AgroSciences	62719-31	N
		Tordon RTU	Dow AgroSciences	62719-31	N
		Grazon P+D	Dow AgroSciences	62719-182	N
		HiredHand P+D	Dow AgroSciences	62719-182	N
		Pathway	Dow AgroSciences	62719-31	N

	STATES WITH APPROVAL BASED UPON CURRENT				
ACTIVE	EIS/ROD & COURT			EPA REG.	CA
INGREDIENT	INJUNCTIONS	TRADE NAME	MANUFACTURER	NUMBER	REG. **
Imazapyr - cont.	AK, AZ, CA, CO, ID, MT, ND,	Ecomazapyr 2 SL	Vegetation Man., LLC	74477-6	N
	NE, NM, NV, OK, SD, TX, UT,	Imazapyr 2 SL	Vegetation Man., LLC	74477-4	N
	WA, WY	Imazapyr 4 SL	Vegetation Man., LLC	74477-5	N
Imazapyr +	AK, AZ, CA, CO, ID, MT, ND, NE,	Mojave 70 EG	Alligare, LLC	74477-9-81927	N
Diuron	NM, NV, OK, SD, TX, UT, WA, WY	Sahara DG	BASF	241-372	N
		Imazuron E-Pro	Etigra, LLC	79676-54	N
		SSI Maxim Topsite 2.5G	SSI Maxim Co., Inc.	34913-22	N
Imazapyr +	AK, AZ, CA, CO, ID, MT, ND,	Lineage Clearstand	DuPont	352-766	N
Metsulfuron methyl	NE, NM, NV, OK, SD, TX, UT,				
	WA, WY				
Imazapyr +	AK, AZ, CA, CO, ID, MT, ND,	Lineage HWC	DuPont	352-765	N
Sulfometuron methyl +	NE, NM, NV, OK, SD, TX, UT,	Lineage Prep	DuPont	352-767	N
Metsulfuron methyl	WA, WY				
NOTE: In accordance with the Record of Decision for the <i>Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (PEIS)</i>, the aerial application of these herbicides is prohibited.					
Metsulfuron methyl	AK, AZ, CO, ID, MT, ND, NE,	MSM 60	Alligare, LLC	81927-7	N
	NM, NV, OK, SD, TX, UT, WA,	Escort DF	DuPont	352-439	N
	WY	Escort XP	DuPont	352-439	N
		MSM E-AG 60 EG Herbicide	Etigra, LLC	81959-14	N
		MSM E-Pro 60 EG Herbicide	Etigra, LLC	81959-14	N
		Patriot	Nufarm Americas Inc.	228-391	N
		PureStand	Nufarm Americas Inc.	71368-38	N
		Metsulfuron Methyl DF	Vegetation Man., L.L.C.	74477-2	N

	STATES WITH APPROVAL BASED UPON CURRENT				
ACTIVE	EIS/ROD & COURT			EPA REG.	CA
INGREDIENT	INJUNCTIONS	TRADE NAME	MANUFACTURER	NUMBER	REG. **
Hexazinone +	AK, AZ, CO, ID, MT, ND, NE,	Westar	DuPont Crop Protection	352-626	Y
Sulfometuron methyl	NM, NV, OK, SD, TX, UT, WA, WY	Oustar	DuPont Crop Protection	352-603	Y
NOTE: In accordance with the Record of Decision for the <i>Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (PEIS)</i>, the aerial application of these herbicides is prohibited.					
Imazapic	AZ, CO, ID, MT, ND, NE, NM, NV, OK, SD, TX, UT, WA, WY	Panoramic 2SL Plateau Imazapic E 2 SL	Alligare, LLC BASF Etigra, LLC	66222-141-81927 241-365 79676-65	N N N
Imazapic + Glyphosate	AZ, CO, ID, MT, ND, NE, NM, NV, OK, SD, TX, UT, WA, WY	Journey	BASF	241-417	N
Imazapyr	AK, AZ, CA, CO, ID, MT, ND, NE, NM, NV, OK, SD, TX, UT, WA, WY	Imazapyr 2SL Imazapyr 4SL Ecomazapyr 2SL Arsenal Railroad Herbicide Chopper Arsenal Applicators Conc. Arsenal Arsenal PowerLine Stalker Habitat Imazapyr E-Pro 2 - VM & Aquatic Herbicide Imazapyr E-Pro 4 - Forestry Imazapyr E-Pro 2E - Site Prep & Basal Polaris RR Polaris SP Polaris AC Polaris AQ Polaris Herbicide SSI Maxim Arsenal 0.5G	Alligare, LLC Alligare, LLC Alligare, LLC BASF BASF BASF BASF BASF BASF Etigra, LLC Etigra, LLC Etigra, LLC Nufarm Americas Inc. Nufarm Americas Inc. Nufarm Americas Inc. Nufarm Americas Inc. Nufarm Americas Inc. SSI Maxim Co., Inc.	81927-23 81927-24 81927-22 241-273 241-296 241-299 241-346 241-431 241-398 241-426 81959-8 81959-9 81959-7 241-273-228 241-296-228 241-299-228 241-426-228 241-346-228 34913-23	N N N N Y N N N N Y Y N N N Y Y N N

	STATES WITH APPROVAL				
	BASED UPON CURRENT				
ACTIVE	EIS/ROD & COURT			EPA REG.	CA
INGREDIENT	INJUNCTIONS	TRADE NAME	MANUFACTURER	NUMBER	REG. **
Glyphosate - cont.	AK, AZ, CA, CO, ID, MT, ND,	Roundup PRO	Monsanto	524-475	Y
	NE, NM, NV, OK, OR, SD, TX,	Roundup PRO Concentrate	Monsanto	524-529	Y
	UT, WA, WY	Roundup PRO Dry	Monsanto	524-505	Y
		Roundup PROMAX	Monsanto	524-579	Y
		GlyphoMate 41	PBI Gordon Corp.	2217-847	Y
		Aqua Neat	Nufarm Americas Inc.	228-365	Y
		Foresters	Nufarm Americas Inc.	228-381	Y
		Razor	Nufarm Americas Inc.	228-366	Y
		Razor Pro	Nufarm Americas Inc.	228-366	Y
		AquaPro Aquatic Herbicide	SePRO Corporation	62719-324-67690	Y
		Rattler	Setre (Helena)	524-445-5905	Y
		Buccaneer	Tenkoz	55467-10	Y
		Buccaneer Plus	Tenkoz	55467-9	Y
		Mirage Herbicide	UAP-Platte Chem. Co.	524-445-34704	Y
		Mirage Plus Herbicide	UAP-Platte Chem. Co.	524-454-34704	Y
		Glyphosate 4	Vegetation Man., LLC	73220-6-74477	Y
Glyphosate + 2,4-D	AK, AZ, CA, CO, ID, MT, ND,	Landmaster BW	Albaugh, Inc./Agri Star	42570-62	N
	NE, NM, NV, OK, OR, SD, TX,	Campaign	Monsanto	524-351	N
	UT, WA, WY	Landmaster BW	Monsanto	524-351	N
Glyphosate + Dicamba	AK, AZ, CA, CO, ID, MT, ND,	Fallowmaster	Monsanto	524-507	N
	NE, NM, NV, OK, OR, SD, TX,				
	UT, WA, WY				
Hexazinone	AK, AZ, CA, CO, ID, MT, ND,	Velpar ULW	DuPont	352-450	N
	NE, NM, NV, OK, SD, TX, UT,	Velpar L	DuPont	352-392	Y
	WA, WY	Velpar DF	DuPont	352-581	Y
		Pronone MG	Pro-Serve	33560-21	N
		Pronone 10G	Pro-Serve	33560-21	Y
		Pronone 25G	Pro-Serve	33560-45	N

	STATES WITH APPROVAL BASED UPON CURRENT				
ACTIVE	EIS/ROD & COURT			EPA REG.	CA
INGREDIENT	INJUNCTIONS	TRADE NAME	MANUFACTURER	NUMBER	REG. **
Fluridone	AK, AZ, CA, CO, ID, MT, ND,	Avast!	SePRO	67690-30	Y
	NE, NM, NV, OK, SD, TX, UT,	Sonar AS	SePRO	67690-4	Y
	WA, WY	Sonar Precision Release	SePRO	67690-12	Y
		Sonar Q	SePRO	67690-3	Y
		Sonar SRP	SePRO	67690-3	Y
Glyphosate	AK, AZ, CA, CO, ID, MT, ND,	Aqua Star	Albaugh, Inc./Agri Star	42750-59	Y
	NE, NM, NV, OK, OR, SD, TX,	Forest Star	Albaugh, Inc./Agri Star	42570-61	Y
	UT, WA, WY	Gly Star Original	Albaugh, Inc./Agri Star	42750-60	Y
		Gly Star Plus	Albaugh, Inc./Agri Star	42750-61	Y
		Gly Star Pro	Albaugh, Inc./Agri Star	42750-61	Y
		Glyphosate 4 PLUS	Alligare, LLC	81927-9	Y
		Glyphosate 5.4	Alligare, LLC	81927-8	Y
		Glyfos	Cheminova	4787-31	Y
		Glyfos PRO	Cheminova	67760-57	Y
		Glyfos Aquatic	Cheminova	4787-34	Y
		ClearOut 41	Chem. Prod. Tech., LLC	70829-2	N
		ClearOut 41 Plus	Chem. Prod. Tech., LLC	70829-3	N
		Accord Concentrate	Dow AgroSciences	62719-324	Y
		Accord SP	Dow AgroSciences	62719-322	Y
		Accord XRT	Dow AgroSciences	62719-517	Y
		Accord XRT II	Dow AgroSciences	62719-556	Y
		Glypro	Dow AgroSciences	62719-324	Y
		Glypro Plus	Dow AgroSciences	62719-322	Y
		Rodeo	Dow AgroSciences	62719-324	Y
		Mirage	Loveland Products Inc.	34704-889	Y
		Mirage Plus	Loveland Products Inc.	34704-890	Y
		Aquamaster	Monsanto	524-343	Y
		Roundup Original	Monsanto	524-445	Y
		Roundup Original II	Monsanto	524-454	Y
		Roundup Original II CA	Monsanto	524-475	Y
		Honcho	Monsanto	524-445	Y
		Honcho Plus	Monsanto	524-454	Y

	STATES WITH APPROVAL				
	BASED UPON CURRENT				
ACTIVE	EIS/ROD & COURT			EPA REG.	CA
INGREDIENT	INJUNCTIONS	TRADE NAME	MANUFACTURER	NUMBER	REG. **
Dicamba +	AK, AZ, CA, CO, ID, MT, ND,	Outlaw	Albaugh, Inc./Agri Star	42750-68	N
2,4-D	NE, NM, NV, OK, OR, SD, TX,	Range Star	Albaugh, Inc./Agri Star	42750-55	N
	UT, WA, WY	Weedmaster	BASF Ag. Products	7969-133	Y
		Rifle-D	Loveland Products Inc.	34704-869	N
		KambaMaster	Nufarm Americas Inc.	71368-34	N
		Veteran 720	Nufarm Americas Inc.	228-295	Y
Dicamba +	AZ, CO, ID, MT, ND, NE, NM,	Distinct	BASF Ag. Products	7969-150	N
Diflufenzopyr	NV, OK, SD, TX, UT, WA, WY	Overdrive	BASF Ag. Products	7969-150	N
NOTE: In accordance with the Record of Decision for the <i>Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (PEIS)</i> , the aerial application of these herbicides is prohibited.					
Diquat	AK, AZ, CA, CO, ID, MT, ND, NE,	Reward	Syngenta Crop Prot., Inc.	100-1091	Y
	NM, NV, OK, SD, TX, UT, WA, WY				
Diuron	AK, AZ, CA, CO, ID, MT, ND,	Diuron 80DF	Agrilience, L.L.C.	9779-318	N
	NE, NM, NV, OK, SD, TX, UT,	Diuron 80DF	Alligare, LLC	81927-12	Y
	WA, WY	Karmex DF	DuPont	352-692	Y
		Karmex XP	DuPont	352-692	Y
		Karmex IWC	DuPont	352-692	Y
		Direx 4L	DuPont	352-678	Y
		Direx 80DF	Griffin Company	1812-362	Y
		Direx 4L	Griffin Company	1812-257	Y
		Diuron 4L	Loveland Products Inc.	34704-854	Y
		Diuron 80 WDG	Loveland Products Inc.	34704-648	N
		Diuron 4L	Makteshim Agan of N.A.	66222-54	N
		Diuron 80WDG	UAP-Platte Chem. Co.	34704-648	N
		Vegetation Man. Diuron 80 DF	Vegetation Man., LLC	66222-51-74477	N
		Diuron-DF	Wilbur-Ellis	00352-00-508-02935	N
		Diuron 80DF	Winfield Solutions, LLC	9779-318	N

	STATES WITH APPROVAL BASED UPON CURRENT				
ACTIVE	EIS/ROD & COURT			EPA REG.	CA
INGREDIENT	INJUNCTIONS	TRADE NAME	MANUFACTURER	NUMBER	REG. **
2,4-D - cont.	AK, AZ, CA, CO, ID, MT, ND,	WEEDstroy AM-40	Nufarm Americas Inc.	228-145	Y
	NE, NM, NV, OK, OR, SD, TX,	Hi-Dep	PBI Gordon Corp.	2217-703	N
	UT, WA, WY	2,4-D Amine	Setre (Helena)	5905-72	N
		Barrage LV Ester	Setre (Helena)	5905-504	N
		2,4-D LV4	Setre (Helena)	5905-90	N
		2,4-D LV6	Setre (Helena)	5905-93	N
		Clean Crop Amine 4	UAP-Platte Chem. Co.	34704-5 CA	Y
		Clean Crop Low Vol 6 Ester	UAP-Platte Chem. Co.	34704-125	N
		Salvo LV Ester	UAP-Platte Chem. Co.	34704-609	N
		2,4-D 4# Amine Weed Killer	UAP-Platte Chem. Co.	34704-120	N
		Clean Crop LV-4 ES	UAP-Platte Chem. Co.	34704-124	N
		Savage DF	UAP-Platte Chem. Co.	34704-606	Y
		Cormbelt 4 lb. Amine	Van Diest Supply Co.	11773-2	N
		Cormbelt 4# LoVol Ester	Van Diest Supply Co.	11773-3	N
		Cormbelt 6# LoVol Ester	Van Diest Supply Co.	11773-4	N
		Amine 4	Wilbur-Ellis Co.	2935-512	N
		Lo Vol-4	Wilbur-Ellis Co.	228-139-2935	N
		Lo Vol-6 Ester	Wilbur-Ellis Co.	228-95-2935	N
		Agrisolution 2,4-D LV6	Winfield Solutions, LLC	1381-101	N
		Agrisolution 2,4-D Amine 4	Winfield Solutions, LLC	1381-103	N
		Agrisolution 2,4-D LV4	Winfield Solutions, LLC	1381-102	N
Dicamba	AK, AZ, CA, CO, ID, MT, ND,	Dicamba DMA	Albaugh, Inc./Agri Star	42750-40	N
	NE, NM, NV, OK, OR, SD, TX,	Vision	Albaugh, Inc.	42750-98	N
	UT, WA, WY	Cruise Control	Alligare, LLC	42750-40-81927	N
		Banvel	Arysta LifeScience N.A. Corp.	66330-276	Y
		Clarity	BASF Ag. Products	7969-137	Y
		Rifle	Loveland Products Inc.	34704-861	Y
		Banvel	Micro Flo Company	51036-289	Y
		Diablo	Nufarm Americas Inc.	228-379	Y
		Vanquish Herbicide	Nufarm Americas Inc.	228-397	Y
		Vanquish	Syngenta	100-884	N

	STATES WITH APPROVAL				
	BASED UPON CURRENT				
ACTIVE	EIS/ROD & COURT			EPA REG.	CA
INGREDIENT	INJUNCTIONS	TRADE NAME	MANUFACTURER	NUMBER	REG. **
2,4-D	AK, AZ, CA, CO, ID, MT, ND,	Agrisolution 2,4-D LV6	Agrialiance, L.L.C.	1381-101	N
	NE, NM, NV, OK, OR, SD, TX,	Agrisolution 2,4-D Amine 4	Agrialiance, L.L.C.	1381-103	N
	UT, WA, WY	Agrisolution 2,4-D LV4	Agrialiance, L.L.C.	1381-102	N
		2,4-D Amine 4	Albaugh, Inc./Agri Star	42750-19	Y
		2,4-D LV 4	Albaugh, Inc./Agri Star	42750-15	Y
		Solve 2,4-D	Albaugh, Inc./Agri Star	42750-22	Y
		2,4-D LV 6	Albaugh, Inc./Agri Star	42750-20	N
		Five Star	Albaugh, Inc./Agri Star	42750-49	N
		D-638	Albaugh, Inc./Agri Star	42750-36	N
		2,4-D LV6	Helena Chem. Co.	4275-20-5905	N
		2,4-D Amine	Helena Chem. Co.	5905-72	N
		Opti-Amine	Helena Chem. Co.	5905-501	N
		Barrage HF	Helena	5905-529	N
		HardBall	Helena	5905-549	N
		Unison	Helena	5905-542	N
		Amine 4CA 2,4-D Weed Killer	Loveland Products Inc.	34704-5	Y
		Clean Amine	Loveland Products Inc.	34704-120	N
		Low Vol 4 Ester Weed Killer	Loveland Products Inc.	34704-124	N
		Low Vol 6 Ester Weed Killer	Loveland Products Inc.	34704-125	N
		LV-6 Ester Weed Killer	Loveland Products Inc.	34704-6	Y
		Saber	Loveland Products Inc.	34704-803	N
		Saber CA	Loveland Products Inc.	34704-803	Y
		Salvo	Loveland Products Inc.	34704-609	N
		Savage DF	Loveland Products Inc.	34704-606	Y
		Aqua-Kleen	NuFarm Americas Inc.	71368-4	N
		Esteron 99C	NuFarm Americas Inc.	62719-9-71368	N
		Weedar 64	NuFarm Americas Inc.	71368-1	Y
		Weedone LV-4	NuFarm Americas Inc.	228-139-71368	Y
		Weedone LV-4 Solventless	NuFarm Americas Inc.	71368-14	Y
		Weedone LV-6	NuFarm Americas Inc.	71368-11	Y
		Formula 40	Nufarm Americas Inc.	228-357	Y
		2,4-D LV 6 Ester	Nufarm Americas Inc.	228-95	Y
		Platoon	Nufarm Americas Inc.	228-145	N

Herbicides Approved for Use on BLM Lands*					
				Update	October 10, 2008
	STATES WITH APPROVAL BASED UPON CURRENT				
ACTIVE	EIS/ROD & COURT			EPA REG.	CA
INGREDIENT	INJUNCTIONS	TRADE NAME	MANUFACTURER	NUMBER	REG. **
Bromacil	AK, AZ, CA, CO, ID, MT, ND,	Bromacil 80DF	Alligare, LLC	81927-4	Y
	NE, NM, NV, OK, SD, TX, UT,	Hyvar X	DuPont	352-287	Y
	WA, WY	Hyvar XL	DuPont	352-346	Y
Bromacil +	AK, AZ, CA, CO, ID, MT, ND,	Bromacil/Diuron 40/40	Alligare, LLC	81927-3	Y
Diuron	NE, NM, NV, OK, SD, TX, UT,	Krovar I DF	DuPont	352-505	Y
	WA, WY	Weed Blast Res. Weed Cont.	Loveland Products Inc.	34704-576	N
		DiBro 2+2	Nufarm Americas Inc.	228-227	Y
		DiBro 4+4	Nufarm Americas Inc.	228-235	N
		DiBro 4+2	Nufarm Americas Inc.	228-386	N
		Weed Blast 4G	SSI Maxim	34913-19	N
Chlorsulfuron	AK, AZ, CA, CO, ID, MT, ND,	Telar DF	DuPont	352-522	Y
	NE, NM, NV, OK, SD, TX, UT,	Telar XP	DuPont	352-654	Y
	WA, WY				
Clopyralid	AK, AZ, CA, CO, ID, MT, ND,	Spur	Albaugh, Inc.	42750-89	N
	NE, NM, NV, OK, SD, TX, UT,	Pyramid R&P	Albaugh, Inc.	42750-94	N
	WA, WY	Clopyralid 3	Alligare, LLC	42750-94-81927	Y
		Cody Herbicide	Alligare, LLC	81927-28	Y
		Reclaim	Dow AgroSciences	62719-83	N
		Stinger	Dow AgroSciences	62719-73	Y
		Transline	Dow AgroSciences	62719-259	Y
		CleanSlate	Nufarm Americas Inc.	228-491	Y
Clopyralid +	AK, AZ, CA, CO, ID, MT, ND,	Curtail	Dow AgroSciences	62719-48	N
2,4-D	NE, NM, NV, OK, SD, TX, UT,	Commando	Albaugh, Inc.	42750-92	N
	WA, WY				

Update October 10, 2008

Appendix B

Approved Herbicides and Adjuvants

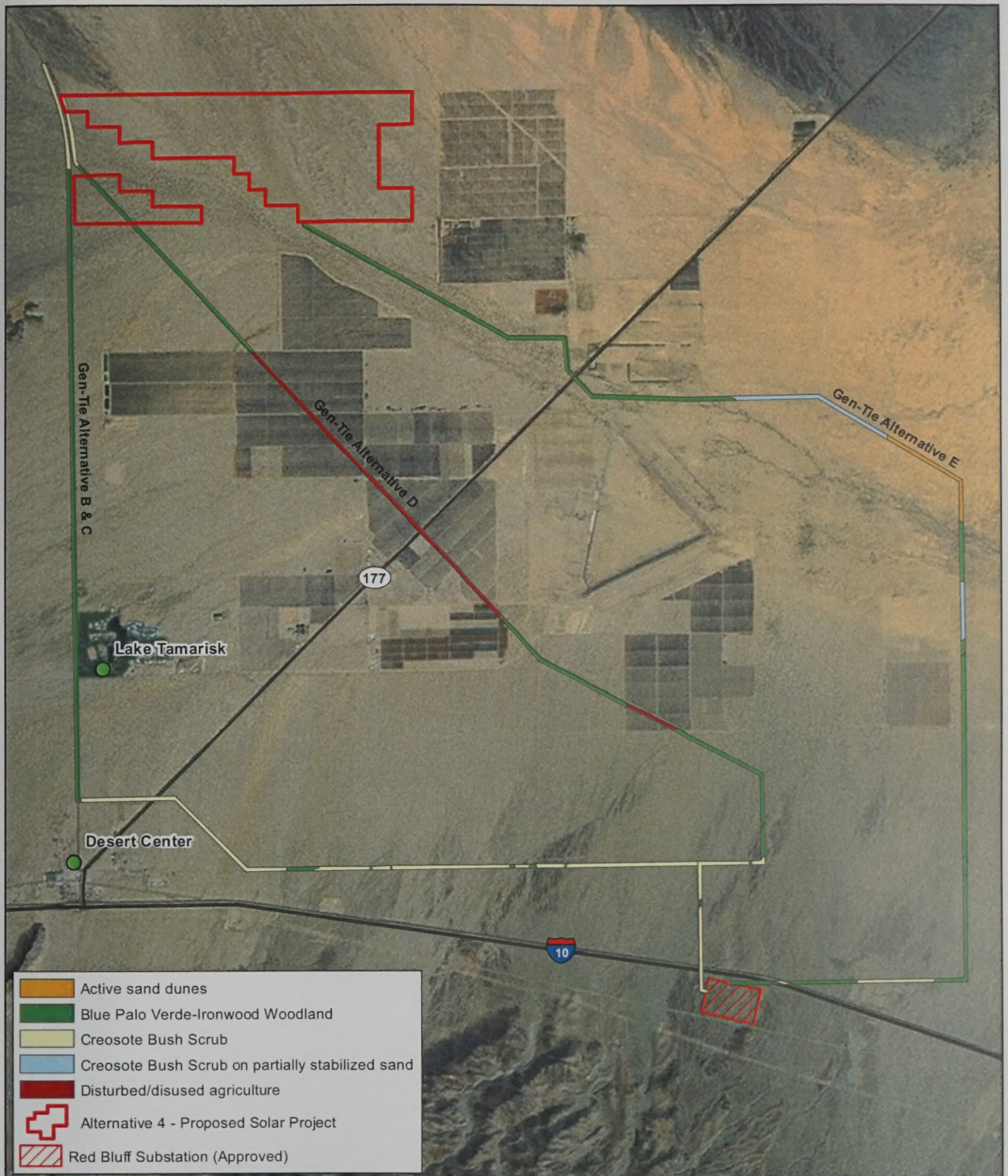


Figure 4

**Vegetation:
Gen-Tie Line Alignments**



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Miles

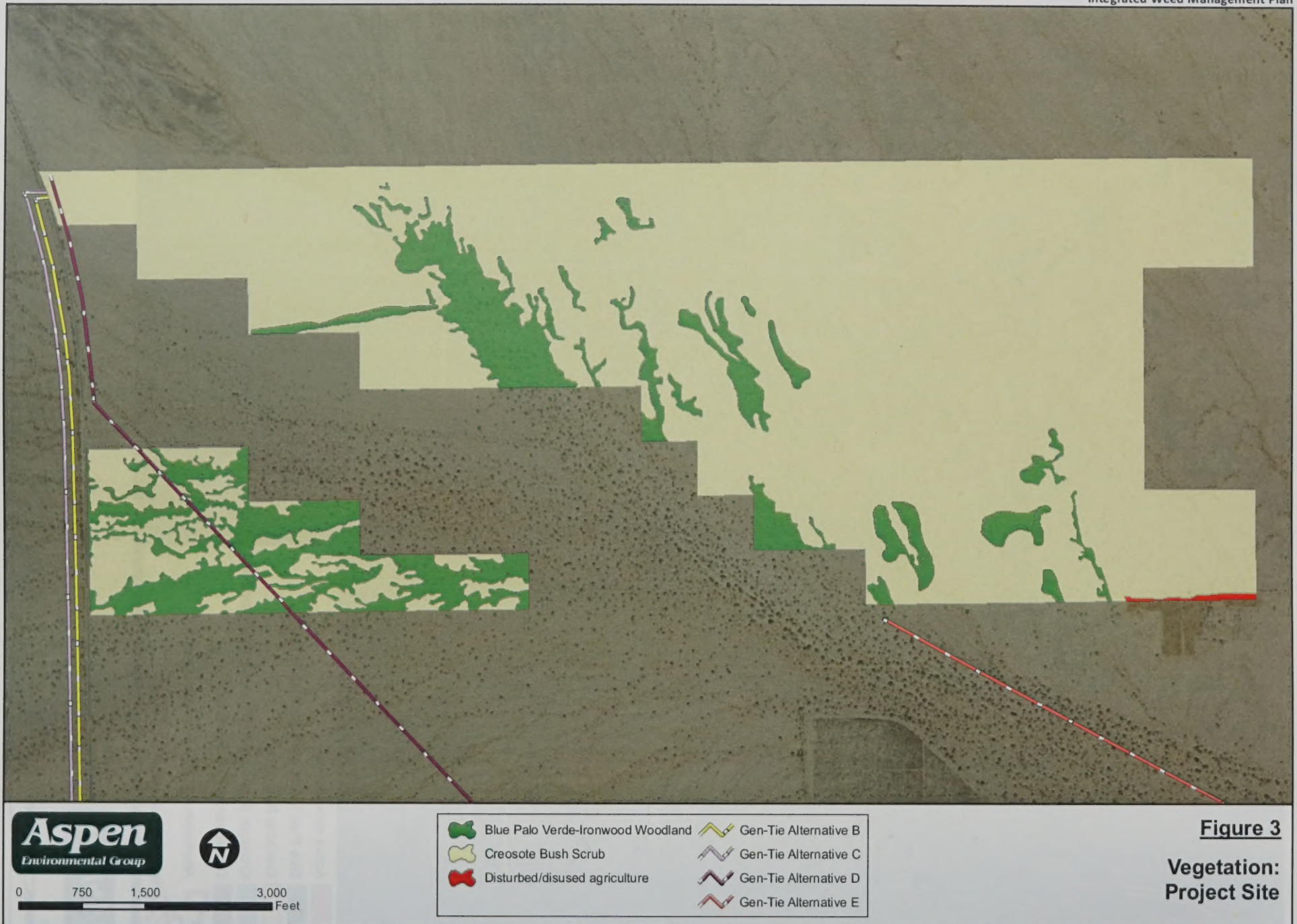
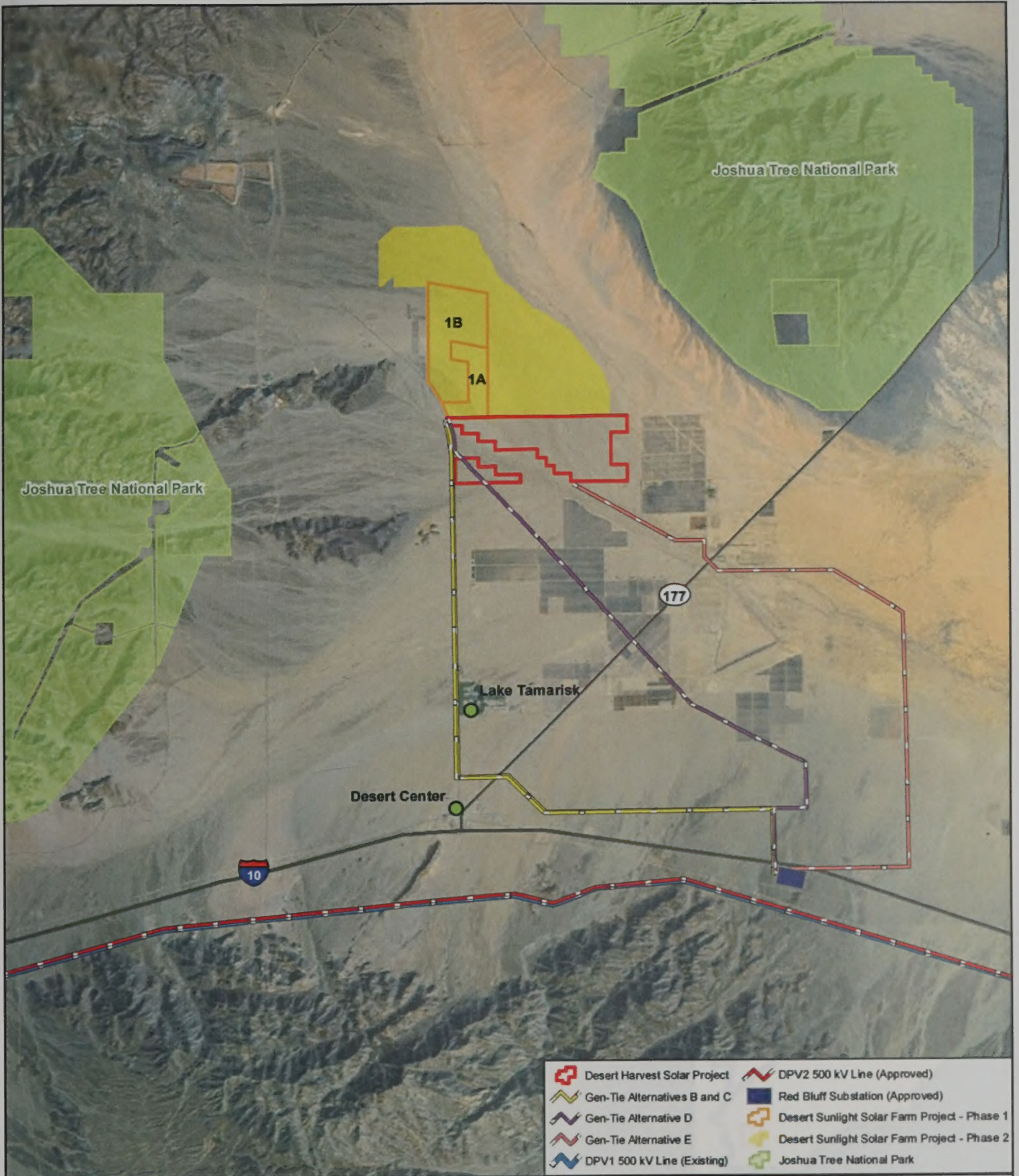


Figure 3
Vegetation:
Project Site

DESERT HARVEST SOLAR PROJECT
Integrated Weed Management Plan

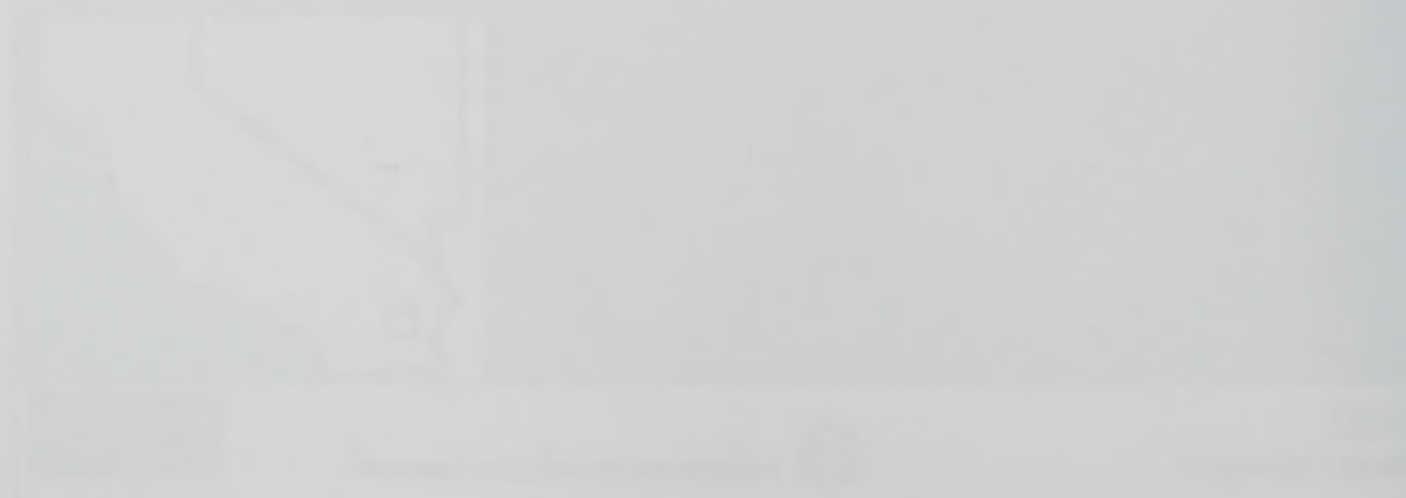


**DESERT HARVEST SOLAR PROJECT
Integrated Weed Management Plan**



Appendix A

Figures



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annual Weed Management Reports to the BLM, CDFG, USFWS, and JTNP for review and approval. In addition, the Designated Biologists will be responsible for providing a short memo to each agency after completing each of the two annual monitoring efforts (early spring and late summer/early fall). These memos will simply summarize the results of monitoring and briefly describe planned (or completed) control efforts, and highlight any new or unexpected findings, particularly any weeds new to the site or to the area.

Each annual report will include the following contents:

- The location, species, extent, and density of weeds on the site. Data will include maps, text, tabular data, and photographs of any significant findings (previously unrecorded weed species, or any dense weed infestations resistant to control and threatening to spread off-site);
- Management efforts, including date, location, type of treatment implemented, results, and ongoing evaluation of success of treatment; and
- Information on implementation and success of preventative measures, including status of equipment wash facilities, list of workers that have completed the worker environmental training program, and copies of vehicle wash logs.

9.0 LITERATURE CITED

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Table 2. Herbicide Application Matrix

Weed Species	Treatment Timeframe	Treatment Method(s)	Active Ingredient / Application Rate
Salt cedar (tamarisk)	Year-around	Cut stump or foliar	Imazapyr (3 qt./ acre) or Triclopyr (2 gal./acre)
Saharan mustard	Early spring	Foliar	Glyphosate (4 qt./ acre)
Camelthorn	Spring or fall	Foliar	Imazapyr (3-4 pt./ acre)
Russian thistle	Early spring	Foliar	Imazapyr (2-3 pt./ acre) or Glyphosate (4 qt./ acre)
Common annuals, including red brome, redstem filaree, and Mediterranean grass	Spring	Foliar	Glyphosate (1 qt./ acre)

7.5 Potential Effects of Herbicide Use

Herbicides pose risks to terrestrial and aquatic vegetation. Most aquatic herbicides, and several terrestrial herbicides, are non-selective and could adversely impact non-target vegetation. Accidental spills and herbicide drift from treatment areas could be particularly damaging to non-target vegetation on BLM land, and crop plants or other vegetation found on privately-owned lands near treatment areas. Herbicides may also pose risks to terrestrial or aquatic animal species. Herbicides that persist on site could adversely affect animals that feed on target plants or are exposed to the herbicides (e.g., by digging or rolling in treated soil). Accidental spills and herbicide drift from treatment areas could reach non-target vegetation or habitat on public or private lands near treatment areas. Section 7.4 includes specific measures to avoid application at project perimeters, in the vicinity of native vegetation or special-status plants, and to avoid overspray or spillage in any areas. In addition, Section 7.4 describes proposed usage and formulations of herbicides at the DHSP. Use of herbicides would be in accordance with the measures and standard operating procedures in the BLM's Herbicide PEIS. As described in Chapter 1 of the DHSP DEIS, that document is tiered to the Herbicide PEIS. Complying with the measures and standard operating procedures in the Herbicide PEIS, MM PHS-9, as well as other limitations described above, would avoid potential adverse effects of herbicides to native vegetation and special-status plants. Risks to vegetation from proposed herbicides would be similar to, or less than, risks from currently-available herbicides. Buffer zones would be used to reduce the risks to vegetation from herbicide treatments.

8.0 REPORTING

Throughout the construction, operation, and decommissioning phases, and for a minimum of 3 years following completion of decommissioning, the Designated Biologist will be responsible for providing

quantities. The SPCC Plan would address methods and procedures for managing these products, lighting, security, containment requirements, training requirements, staff responsibilities for inspecting storage and dispensing equipment; and equipment and procedures for responding to a spill or release of stored petroleum products.

- Riprap increases surface roughness and slows runoff velocities, decreasing sediment transport, and increasing flow depth. Riprap would be used in conjunction with decompaction of soil, as riprap would not mitigate flow or volume.
- Check whether dams can be constructed to address specific post-development hydraulic characteristics, if needed.

Mitigation Measure WAT-9 (Accidental Spill Control and Environmental Training) requires:

"Prior to the onset of construction of the project, the following specifications must be provided by the Applicant to the BLM: define areas where hazardous materials would be stored, where trash would be placed, where rolling equipment would be parked, fueled and serviced, and where construction materials such as reinforcing bars and structural steel members would be stored. The Applicant shall also prescribe hazardous materials handling procedures for reducing the potential for a spill during construction, and shall include an emergency response program to ensure quick and safe cleanup of accidental spills. These specifications may be included in the Surface Water Protection Plan (SWPP) described in MM WAT-4, or may be included as a separate plan. Compliance will be verified by the Environmental Monitor at the time of construction."

Mitigation Measure MM VEG-8 includes numerous measures for streambed protection, including the requirement that that "Mixing of herbicides and adjuvants in the field would be conducted outside of jurisdictional wash habitat and in areas that would not allow drainage to a water body in the case of a spill. This is consistent with the SOP for water resources."

The mitigation measures quoted above are consistent with applicable Standard Operating Procedures (SOPs) and mitigation measures contained in the PEIS. If cases of any conflict between project mitigation measures and SOPs, the more restrictive of the two standards will apply.

There are no riparian, wetland, or aquatic habitats on the project site, and mitigation measures require that water overflow from tanks, pumps, or other sources must be monitored and controlled. Therefore, there will be little opportunity for weeds that are invasive in these habitats to become established on the site. In the even that salt cedar or similar species colonize around project facilities, the weed monitoring program (Section 6) will identify these plants before they become significant infestations, and control will generally be by mechanical means (pulling). In the unlikely event that salt cedar becomes well-enough established that mechanical pulling is ineffective, then cut-stump treatment using Imazapyr or Triclopyr may be implemented, and only away from any open water. This IWMP does not propose to use herbicides in or around open water at any time.

Table 2 provides an herbicide application matrix that outlines herbicides, application rate treatment method(s), and treatment timeframe for a variety of weeds that could occur on site.

not be applied directly to wildlife, products identified as non-toxic to birds and small mammals shall be used if nests or dens are observed, and herbicides shall not be applied within 50 feet of any surface waterbody when water is present. Herbicides shall not be applied if it is raining at the site, rain is imminent, or the target area has puddles or standing water. Herbicides shall not be applied when wind velocity exceeds 10 miles per hour. If spray is observed to be drifting to a non-target location, spraying shall be discontinued until conditions causing the drift have abated.

Prior to any herbicide application, the herbicide applicator shall contact the Environmental Monitor to show where work will be done and to receive information/ training about potentially sensitive biological resources that may be within the area to be sprayed and methods to apply to minimize those impacts. A Worker's Training Manual shall be prepared and include a provision on herbicide application. Once facility operation commences, this Manual shall be given to any herbicide applicator to be reviewed prior to spraying.

Monitoring: Compliance will be verified by onsite environmental monitor during construction, and by Operations Plant Manager.

Applicant Measure WR-1 (Manage Hazardous Materials and Use SPCC Plan) requires that the applicant or its agents will take numerous measures to manage hazardous materials:

- *Train construction staff in the management of hazardous materials and use of spill control and cleanup equipment;*
- *Have a clear chain of command within the organizational structure with responsibility for implementing, monitoring, and correcting Best Management Practices (BMPs);*
- *Cover and contain hazardous materials so that they are not in contact with precipitation or runoff;*
- *Store hazardous materials in one or more central areas, and institute rules requiring all hazardous materials to be secured at the end of the day;*
- *Maintain good inventory records; store hazardous liquids and dispensing equipment in secondary containment;*
- *Maintain adequate quantities of spill containment and response equipment at readily accessible points throughout the site;*
- *Identify the worst case and most likely spill scenarios, and provide spill response equipment adequate to respond to these scenarios;*
- *Use chemicals presenting the least environmental hazard wherever possible;*
- *Store the smallest quantities of hazardous materials possible on the site;*
- *Maintain site security to reduce vandalism;*
- *Require all contractors to abide by the program BMPs and to identify any hazardous materials and specific BMPs pertaining to their trade or activity.*
- *The SPCC Plan for the site would address storage of mineral oil contained in transformers. A SPCC Plan is required when 10,000 gallons or more of mineral oil in electrical equipment is contained on site, or when 1,320 gallons of petroleum is stored on the site, although an SPCC Plan can be voluntarily implemented for lesser*

- Apply follow-up foliar applications as described in the previous section to stem regrowth that occurs after initial control effort.
- Continue monitoring cut stems for as long as necessary to ensure complete mortality.

Controlling seed banks with pre-emergent herbicides:

Pre-emergent herbicides may be used in areas that have repeated infestations of annual weeds, with evidence of a persisting seed bank. These areas will be sprayed with pre-emergent herbicides during appropriate pre-germination periods. Application will follow the spray application guidelines described above for post-emergent herbaceous species.

7.4 Proposed Herbicide Application

The primary use of herbicides at the DHSP will be for control of invasive annual herbaceous upland weeds expected to propagate on disturbed soils throughout all project facilities. The most common annual upland weeds are likely to be Saharan mustard, red brome, redstem filaree, and Mediterranean grass. Herbicide treatment will be utilized within the solar generator site and related facilities, on disturbed soils at the gen-tie structures and other work sites (only as compatible with revegetation efforts). Herbicides will not be utilized within or adjacent to any undisturbed native vegetation, e.g., buffer areas beyond the perimeter of the DHSP site or disturbed work areas, or margins of work sites on the gen-tie line. Herbicide treatments conducted on the gen-tie line or at any other location outside the project's desert tortoise exclusion fence would use only the herbicide Glyphosate, which has been shown to have low toxicity to test animals.

The method of herbicide treatment for the control of upland weeds would not be expanded beyond those herbicides analyzed in the BLM's 2007 *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS). Under this alternative, ground applications of herbicides approved for use in California such as Glyphosate-, Imazapyr- or Clopyralid-based herbicides would be used at application rates consistent with the label and the 2007 PEIS. Application methods consistent with the label would be used to treat upland weeds. These methods would consist of using a hand held compression sprayer or backpack sprayer. All treatments would be supervised or overseen by a certified pesticide applicator who is knowledgeable in plant identification and familiar with proper herbicide application techniques.

Access to the treatment sites would be by existing roads or new roads to be constructed as a part of the DHSP. No additional access routes would be constructed for weed management, and there would be no vehicle access off established roads. Herbicide, equipment, and personnel would be brought to treatment sites by a truck, van, or car.

All herbicide application would conform to requirements of DHSP DEIS MMs quoted below:

Mitigation Measure HZ-1.5 (Use licensed herbicide applicator) requires that:

"During the construction and operational phases of the project, the contractor or personnel applying herbicides shall have all the appropriate State and local herbicide applicator licenses and comply with all State and local regulations regarding herbicide use. Herbicides shall be mixed and applied in conformance with the product manufacturer's directions. The herbicide applicator shall be equipped with splash protection clothing and gear, chemical resistant gloves, chemical spill/splash wash supplies, and material safety data sheets (MSDS) for all hazardous materials to be used. To minimize harm to wildlife, vegetation, and waterbodies, herbicides shall

- detergent

Response to herbicide spills will vary with the size and location of the spill, but general procedures include the following:

- traffic control
- dressing the cleanup team in protective clothing
- stopping the leaks
- containing the spilled material
- cleaning up and removing the spilled herbicide or contaminated adsorptive material and soil
- transporting the spilled herbicide and contaminated material to an authorized disposal site

HERBICIDE APPLICATION METHODS BY PLANT TYPE. Controlling post-emergent herbaceous species:

- Apply a foliar application of Round-up™ or Rodeo™ on each plant at a minimum rate of 2.5 percent (plus 2 percent by volume [V/V] of nonionic surfactant). Apply Roundup™ in upland areas. Apply Rodeo™ in areas that are in immediate contact with wetlands and/or other water bodies. The Designated Biologist will determine the appropriate herbicide to use at each location.
- Provide applications on a spray-to-wet basis with coverage uniform and complete.
- Avoid contact with established native shrub and grass species.
- Temporarily discontinue work in the event of gusty winds or winds in excess of 6 mph.
- Temporarily discontinue in the event of rainfall.
- Ensure applicators possess current pest control licenses valid in the State of California and wear gloves, masks, and long sleeves as protection from chemical injuries.
- Leave sprayed vegetation undisturbed for 7 days until visible effects of herbicide application are present such as wilted and brown foliage.
- If any seed reached maturity, remove all treated plant materials by placing all noxious weed material potentially containing propagules in durable bags. Bags shall be sealed prior to transport. Noxious weed material shall be disposed of by covered transport to an appropriate landfill.

Controlling post-emergent woody species:

- Cut sprouts or woody stems to a height of 12 inches or less above ground and remove all aboveground debris for disposal at a suitable landfill.
- Apply Round-Up™ or Rodeo™ at a 100 percent rate to the cut sprouts or stems within 2 minutes of cutting. Use Round-up™ in upland areas. Use Rodeo™ in areas that are in immediate contact with wetlands and/or other water bodies. The Designated Biologist will determine the appropriate herbicide to use at each location.
- Cover all loads with a tarpaulin to transport vegetation trimmings.

- Wind velocity exceeds 6 miles per hour (mph) during application of liquids or 15 mph during application of granular herbicides.
- Snow or ice covers the foliage of weeds.
- Precipitation is occurring or is imminent.
- Air temperatures exceed 90°F.

TRANSPORT AND MIXING. Herbicides will be transported within the project site with the following provisions:

- Only the quantity needed for that day's work will be transported at any given time.
- Concentrate will be transported in approved containers only and in a manner that will prevent tipping or spilling, and in a location that is isolated from the vehicle's driving compartment, food, clothing, and safety equipment.
- Mixing will occur over a drip-catching device, and at a distance greater than 200 feet from open or flowing water, wetlands, or other sensitive resources. No herbicides will be applied at these areas unless authorized by appropriate regulatory agencies.
- Herbicide equipment and containers will be inspected for leaks daily. Disposal of spent containers will be in accordance with the herbicide label.
- During the operations phase of the project, herbicides will be stored only in cabinets of approved design and will be under lock and key.

SPRAY METHODS. Vehicle-mounted sprayers (e.g., handgun, boom, and injector) will be used only in open areas that are readily accessible by vehicle. Hand application methods (e.g., backpack spraying) that target individual plants will be used to treat small or scattered weed populations or in rough terrain. Calibration checks of equipment will be conducted at the beginning of spraying and periodically throughout treatment to ensure proper application rates.

HERBICIDE SPILLS AND CLEANUP. Reasonable precautions will be taken to avoid herbicide spills. In the event of a spill, immediate cleanup will be implemented. Contractors will keep spill kits in their vehicles and in herbicide storage areas to allow for quick and effective response to spills. The following items are to be included in the spill kit:

- protective clothing and gloves
- absorptive clay, "kitty litter," or other commercial adsorbent
- plastic bags and bucket
- shovel
- fiber brush and screw-in handle
- dust pan
- caution tape
- highway flares (use on established roads only)

germination. Post-emergent herbicides are generally lethal to plants after germination, but not to seeds. A few herbicides have both pre- and post-emergent activity. Herbicides can be selective or nonselective. If an herbicide is selective, it will affect some species of plants and not others, e.g., monocots (grasses) vs. dicots (broadleaf plants). A non-selective herbicide is one that is lethal to any plant species to which it is applied.

Herbicides kill plants through contact or systemic action. Contact herbicides are most effective against annual weeds and kill only the plant parts to which the chemical is applied. Systemic herbicides are absorbed either by roots or foliar parts of a plant and are then translocated within the plant. Although systemic herbicides can be effective against annual and perennial weeds, they are particularly effective against established perennial weeds. Pre-emergent herbicides inhibit germination of annuals from seed, but generally do not control perennial plants that germinate from bulbs, corms, rhizomes, stolons, or other vegetative structures. Common herbicide classes include the following:

Dinitroaniline Type: Examples of this class are pendimethalin (Weedgrass™), trifluralin (Treflan™), benfen (Balan™), and combinations of these. These herbicides provide for pre-emergence control of annual grasses and other annuals. Some of these herbicides should not be applied in temperatures above 90 degrees Fahrenheit (°F). All of these herbicides need to be watered into the soil for proper activation. Some persist for several months.

Dithiopyr (Dimension™): A selective herbicide primarily used for pre-emergence annual grass control in established turfgrass. However, it can be used for post emergence control of young grass seedlings. Dithiopyr breaks down in soil due to chemical and microbial degradation.

Glyphosates: The most commonly used post-emergent, non-selective herbicides are in a group called glyphosates. Glyphosate (e.g., Rodeo™, Roundup™, and Accord™) is a nonselective, systemic herbicide that is effective on many annual and perennial plants. Glyphosate is most effective if the entire plant is covered. Glyphosate should not be applied when the temperature exceeds 90°F. Glyphosate has a relatively low degree of oral and dermal acute toxicity (EPA 1993). It is considered to be immobile in soil and readily degrades by soil microbes. Glyphosate is minimally toxic to birds, fish, aquatic invertebrates, and honeybees (EPA 1993).

APPLICATION AND HANDLING. It is the responsibility of the herbicide user to observe all directions, restrictions, and precautions on herbicide labels. Store all herbicides in original containers with labels intact and behind locked doors. Keep herbicides out of the reach of children. The following general precautions will be implemented for herbicide application:

- Use herbicides at correct label application rates and intervals to avoid illegal residues or injury to plants and animals.
- Use herbicides carefully to avoid drift or contamination of non-target areas.
- Surplus herbicides and containers should be disposed of in accordance with label instructions to prevent contamination of water and other hazards.
- Follow directions on the herbicide label regarding restrictions as required by state or federal laws and regulations.
- Avoid any action that may threaten a rare, threatened, or endangered species or its habitat.

LIMITATIONS. Herbicide applications must follow EPA label instructions. Application of herbicides will be suspended when any of the following conditions exists:

Mechanical control methods include hand pulling of weeds and the use of hand or power tools to uproot, girdle, or cut plants. Lever arm tools such as Weed Wrench™ and Root Jack™ may be used to pull out woody shrubs such as tamarisk. Hand removal by pulling is appropriate when the plants are large enough that they will not break and leave the roots in the soil, where they would be likely to resprout. For control of small numbers of rooted woody species, this is the most effective method.

Hand pulling is less effective for weed species that spread via rhizomes or roots (e.g., Bermuda grass). Hoeing or other methods may be effective for these infestations, by carefully avoiding any adjacent native plants. Hoeing or other mechanical disturbance should not be used if weeds have set seed, to avoid further seed dispersal. Hoeing works best on patches of small weeds and on weeds that have a single root mass. It is less effective on larger weeds that can regenerate from cut roots.

Power weed-whips can be used for removal of tall annual species (such as Saharan mustard) but they should not be used on weeds approaching maturity, unless all cut material is carefully collected and removed from the site. Even seeds that have not matured at the time of cutting can finish maturing on the cut material, and then propagate the infestation.

Any plant material removed by mechanical control methods will be bagged and removed from the site, and transported to a landfill in a covered vehicle. No mulch or green waste from weed material will be stored or disposed of on the site.

7.3 Overview of Chemical Control

Where infestations are too large for effective mechanical control, and are not adjacent to native vegetation or other sensitive biological resources, herbicides generally will be used for control. Herbicides may be used for any of the three control strategies (suppress, contain, or eradicate), depending on the species and extent of the infestation.

Only certain herbicides are approved for use by the US Environmental Protection Agency (EPA), and only a subset of these are approved for use on BLM public land in California (Appendix B). This section describes the permitting and regulatory requirements relevant for chemical control of invasive weeds, the types of herbicides available, general application and handling procedures, specific herbicide application methods for pre- and post-emergent control.

PERMITTING AND REGULATORY REQUIREMENTS. Contractors applying herbicides must possess required permits from the state and Riverside County Agricultural Commissioner (as applicable). Permits may contain additional terms and conditions in addition to those described in this plan. Only a State of California and federally certified contractor will be permitted to perform herbicide applications. All herbicides will be applied in accordance with applicable laws, regulations, and permit stipulations. Only herbicides and adjuvants approved by the State of California and federal agency for use on public lands will be used within or adjacent to the project site. A list of approved herbicides and adjuvants is provided in Appendix B.

Guidelines for the use of approved herbicides are presented in the Chemical Pest Control Manual (BLM, n.d.). These guidelines require submittal of a pesticide use proposal (PUP) and pesticide application records (PAR) for the use of herbicides on BLM lands. A sample form required for the submittal of a PUP is included in Appendix C and a sample PAR form is included in Appendix D.

TYPES OF HERBICIDES. Herbicides can be characterized as pre-emergent, post-emergent, selective, and non-selective. A pre-emergent herbicide is one that generally controls un-germinated seeds by inhibiting

- Water tanks;
- Storage and evaporation ponds;
- Roadsides where dust control water may collect;
- Water pipelines on the ground surface;
- Wells and associated facilities;
- Bathrooms, eating areas, wash stations, or any other sites where workers may use water.

Monitoring of these sites will be conducted monthly at minimum, and records of each monitoring date and results will be maintained in the project data files.

7.0 WEED CONTROL

7.1 Control Strategies and Prioritization

Weeds will be controlled according to abundance and extent of infestations and potential threat to offsite habitat. The control strategy for weeds that are ubiquitous in the region (e.g., red brome, redstem filaree, and Saharan mustard) will be suppression, with the objective of maintaining densities and extent at or below baseline levels. Strategies for weeds that are actively spreading in the region (e.g., Cape ricegrass), species that are strongly invasive in riparian habitats (e.g., saltcedar), or species altogether new to the region will be immediate eradication if possible, and containment until eradication is complete.

Infestation sites flagged during monitoring (Section 6, above) will be targeted for control as early as feasible, to prevent weeds from going to seed, reestablishing their seed bank, and spreading farther. Until control is implemented, the infestations will be surrounded by temporary orange vinyl construction fencing to prevent vehicles or pedestrians from entering the area and risking further spread of the targeted weeds. The Designated Biologist will be responsible for ensuring that temporary fencing is in place.

Specific control measures will be planned and implemented for each infestation. The Designated Biologist will review and approve each control measure prior to its implementation.

Weed infestations on linear project features; in high-traffic areas such as project staging areas, operating areas; and along access routes shall be high priority for control. Weeds that are common within the site and surrounding area will generally be given low priority where they occur in relatively low densities or in the interior of the area, distant from surrounding native vegetation. However, these infestations will be given higher priority if abundance is high enough to create a significant new propagule source that may increase weed infestation densities on adjacent lands.

7.2 Mechanical Control

Where weed infestations are small, or where they are adjacent to native vegetation or other sensitive biological resources (e.g., the site perimeter or in buffer areas), mechanical control methods will be implemented. Mechanical control may be appropriate for any of the three control strategies (suppress, contain, or eradicate), depending on the species and extent of the infestation.

Baseline abundance will vary from year to year, depending on rainfall. Surveys to date have not identified any infestations at the project site that exceed the density and extent of those on surrounding lands; however, because of the potential for baseline abundance to vary, the Designated Biologist and qualified monitors will develop brief guidelines to estimate baseline abundance for each seasonal monitoring period. For all other non-native species, every occurrence documented during monitoring efforts will be recorded and targeted for follow-up control.

The locations of all weed infestations noted during monitoring efforts will be documented using hand-held global positioning system (GPS) units, and short descriptions of the location, extent, abundance, and phenology of each weed species (if known) will be recorded. Locations of any species (other than the 5 above), including any species not previously known from the site will also be flagged in the field to enable precise control efforts or other follow-up measures (see Section 7). All monitoring data will be retained and managed by the Designated Biologist in a spreadsheet or other data management software, along with follow-up data regarding control efforts, and follow-up monitoring.

6.2 Scheduling and Field Methods

Monitoring for weeds will be conducted throughout the entire project area, including the solar generator site (including all ancillary facilities, parking areas, administrative sites, and other related facilities); the off-site administration building and adjacent project-related facilities; all linear project components (gen-tie line; underground infrastructure connection between southern and northern PV generation fields); and throughout a 100-foot buffer area in any undisturbed lands adjacent to any project area.

Monitoring will be conducted twice annually throughout the construction, operations, and decommissioning phases of the project, and for a minimum 3-year period following decommissioning, or until any high-priority target weed species have been effectively controlled or eradicated. Complete weed-monitoring surveys will be conducted once in early spring (February or March) to detect winter-germinating species before they set seed; and once in late summer or early fall, to detect summer-germinating species. Depending on timing and amount of annual rainfall on the site (per the data collected at the on-site meteorological station) survey schedules may be adjusted or suspended, based on recommendation of the Designated Biologist and written agreement of BLM, California Department of Fish and Game (CDFG), and US Fish and Wildlife Service (USFWS).

Full-coverage weed monitoring of the project area will be conducted by walking over all access routes, parking areas, lay-down areas, or other disturbed areas (including internal roads throughout the site, the gen-tie line access route, the Kaiser Road right-of-way (ROW) on the underground infrastructure connection between the two solar generator areas, and the off-site administrative building) and throughout a 100-foot buffer in natural lands surrounding the sites. Special emphasis will be given to areas vulnerable to colonization including: roadsides, soil stockpiles, wash stations; previously disturbed areas, areas of prior weed infestation, areas near known weed infestations, and all areas with disturbed soils.

Along the project's linear features, and in the buffer areas surrounding project areas, monitors will also record locations of special status plant occurrences or any other biological resources where herbicide application would be inappropriate.

In addition, the Designated Biologist or other qualified Biological Monitor (per MM VEG-1) will periodically monitor all water sources or other wet areas on the site to check for water leaks and to determine if any weeds have become established. These areas will include, but will not be limited to:

A current written log of on-site vehicle washing and verification/inspection of off-site vehicle washing will be kept on the project site throughout the construction, operations, and decommissioning project phases. Electronic copies of the wash logs will be submitted with the annual reports (Section 8).

Weed-Free Materials. Any plant materials (such as hay bales, wattles, or other erosion control materials) brought onto the site shall be certified weed free. Any seed used in revegetation efforts or for erosion control will be certified weed free, and will consist only of plant species native to the Chuckwalla Valley. Additional products such as gravel, sand bags, silt fences, and mulch may also carry weeds. Such products will be obtained from suppliers who can provide weed free certified materials. Where feasible, mulch used for erosion control will be generated from native vegetation cleared from the site itself. The Designated Biologist will be responsible for checking deliveries and confirming certification of all materials.

Revegetation. enXco will reestablish soil stability and vegetation on temporarily disturbed sites by preparing and implementing a Vegetation Resources Management Plan (described in MM VEG-5). Reclamation, revegetation, or restoration shall occur on all temporarily disturbed areas, including, but not limited to, temporary access roads, construction work temporary lay-down areas, and staging areas.

6.0 MONITORING

6.1 Weed Identification, Mapping, and Data Management

Effective monitoring for weed infestations necessitates accurate identifications of weeds, and accurate distinction among native and non-native species, during early growth (i.e., before the plants set seed, to allow for early control or eradication). All weed monitoring will be conducted by a biologist familiar with the regional flora and familiar with seedling and early vegetative growth forms of regional weeds (Table 1) and common native species. All monitoring reports will include comprehensive species lists of all native and non-native species observed in the survey area. Any species not recognized in the field will be collected and identified using regional identification manuals (e.g., Baldwin et al 2002). Botanists will make pressed specimens of seedling, early-flowering, and mature samples of native and non-native species for further reference. Any species not readily identifiable using regional identification manuals will be preserved as a labeled specimen and forwarded to a recognized herbarium for identification by experts.

For certain weed species already known from the project site, or that are ubiquitous in the region, infestations will be recorded where the density and extent is greater (based on visual estimation) than baseline abundance in the surrounding natural landscape. This will apply only to the following 5 species (see Table 1):

- Saharan mustard
- Red brome
- Redstem filaree
- Russian thistle (tumbleweed)
- Mediterranean grass (split grass)

spread of weeds. Training will be incorporated into the project's Worker Environmental Awareness Program, as required by Mitigation Measure MM VEG-3.

Project workers will be required to inspect their clothing, shoes, and personal equipment, before arriving on the site, and to remove and dispose of weed seed and plant parts. The material will be bagged for disposal in a landfill.

Vehicle Wash Station. Vehicle ingress and egress will be limited to specific sites. All vehicles and heavy equipment entering the project area for the first time will be washed to eliminate or minimize introduction of weed seeds. In addition, any vehicle that has been operated off of paved roads or parking areas off the site (e.g., to shuttle workers or deliver materials and supplies) will be washed before re-entering the site. Vehicles delivering materials or personnel to a designated parking or laydown area will not require washing; however, these designated parking and laydown areas will be subject to weed monitoring and control (Sections 6 and 7, below).

An on-site wash station will be provided for most vehicle washing, near the entrance to the project site at Kaiser Road. Off-site washing may be acceptable only under the following conditions:

- The driver certifies that the vehicle has been fully washed, including the undercarriage, tires, insides of fenders, and other areas where mud or debris may collect, and that the interior has been swept or vacuumed;
- The driver provides a receipt or other verification of off-site washing;
- The vehicle is inspected on-site by a Biological Monitor (MM VEG-1) to confirm no accumulated mud or debris, or other material.

All vehicles arriving from off-site locations will be required to stop for inspection. Vehicles that have not been washed off-site will be washed before entering the site. Vehicles that were washed off-site but which appear to the inspector to have accumulations of mud or debris on the vehicle or equipment that could harbor weed seeds will be required to be washed again before entering the site. Heavy equipment entering the site on trailers must also be washed. The Biological Monitor will ensure that vehicles and equipment are free of soil and debris capable of transporting weed seeds, roots, or rhizomes before the vehicles and equipment are allowed to use access roads.

The wash station will be constructed with either a concrete wash pad or a completely cleared and compacted soil or gravel pad. Silt fencing, weed-free certified hay bales, or other means of trapping wash water, sediment, seeds, and other debris will be installed around the perimeter of the wash station. The wash station's location and proposed containment methods will be reviewed and approved by BLM prior to putting it into use.

Vehicles will be washed with high-pressure water equipment, concentrating on tracks, tires, and the undercarriage, including axles, frame, cross members, motor mounts, and on undersides of fenders, steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs will be swept or vacuumed and refuse will be disposed of in covered waste receptacles. Sediment accumulated from the washing area will be shoveled out regularly and placed in sealed containers for disposal in a landfill. If removal requirements exceed the capability of the wash station, equipment will be washed elsewhere before being allowed on the site.

High: These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed.

Moderate: These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, although establishment is generally dependent on ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited: These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

4.0 DESIGNATED BIOLOGIST RESPONSIBILITIES

The Designated Biologist, to be designated by the project owner (per Mitigation Measure [MM] Veg-1) will be responsible for managing and implementing weed monitoring and control efforts, as follows:

- Scheduling all vehicle and weed monitoring for all project components;
- Verify that vehicle inspections are conducted properly and completely;
- Review planting materials, erosion control materials, and other materials to ensure weed-free certification;
- Ensuring that each person assigned to monitoring for weeds is qualified in plant identification;
- Managing weed monitoring data;
- Prioritizing and implementing control efforts;
- Communicating with the project owner and resource agencies regarding weed management needs and priorities; and
- Preparing and submitting reports.

5.0 PREVENTION

Prevention or minimization of weed introduction and establishment will be implemented as follows:

Project Design and Construction. The extent of soil disturbance will be limited to the fenced project area and the minimum necessary area at each gen-tie tower, pull site, or other work area (per MM VEG-4).

Worker Environmental Training. Weed management will be incorporated as a part of mandatory training for all contractors, subcontractors, inspection personnel, construction managers, construction personnel, groundskeepers, maintenance personnel, and all individuals bringing vehicles or equipment onto the site during construction, operations, and decommissioning phases of the project. Training will include an explanation of the importance of weed management for natural resource values; specific requirements for vehicle washing; and other applicable measures to prevent the introduction and

Weed Species	Habitats, Range, and Control Notes	Rankings	Likelihood of Occurrence at DHSP	Consequences of occurrence/ spread
<i>Salsola</i> spp. Russian thistle, tumbleweed	Widespread and often abundant throughout much of Calif.; including deserts	CDFA: C Cal IPC: Limited-Moderate Impacts/ Invasiveness/ Distribution: varies by species	Occurs on the site and throughout the region	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat
<i>Schismus</i> spp. Mediterranean grass, split grass	Widespread and often abundant throughout much of Calif.; including deserts	CDFA: C Cal IPC: Limited Impacts/ Invasiveness/ Distribution: B/C/A	Occurs on the site and throughout the region	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat
<i>Sisymbrium irio</i> London rocket	Widespread and often common throughout much of Calif.; less common in deserts, mainly in seasonally slightly mesic or shaded sites	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/A	Occurs on the site and throughout the region; shaded areas and increased moisture (through dust control, etc.) likely to cause increased densities	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat
<i>Stipa capensis</i> (= <i>Achnatherum capensis</i>) Cape ricegrass, various other common names	Established in western Coachella Valley, apparently spreading rapidly in that area	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/D	High (periodic introductions are likely; ongoing potential for establishment on the site)	High; actively spreading in low desert region)
<i>Tamarix</i> spp. Tamarisk, saltcedar	Widespread and strongly invasive in riparian habitats throughout California and southwestern desert regions	CDFA: B Cal IPC: Limited-High Impacts/ Invasiveness/ Distribution: varies by species	High (seed introductions likely to be constant; potential for establishment in periodically mesic places such as evaporation pond margins, leaking tanks)	Moderate; already widespread in deserts, but any new persisting seed source can become source of further invasion into natural riparian habitats
<i>Tribulus terrestris</i> Puncture vine	Widespread, especially roadsides, disturbed sites, and agricultural lands	CDFA: C Cal IPC: n/a	High (periodic introductions are likely; ongoing potential for establishment on the site)	Moderate; apparently adapted to regional soils/climate, though may require additional water

California Department of Food and Agriculture ratings (CDFA 2011):

A: Eradication, containment, rejection, or other holding action at the state-county level. Quarantine interceptions to be rejected or treated at any point in the state;

B: Eradication, containment, control or other holding action at the discretion of the commissioner;

C: State endorsed holding action and eradication only when found in nursery; action to retard spread outside of nurseries at the discretion of the commissioner—reject only when found in a crop seed for planting or at the discretion of the commissioner

Cal-IPC ratings: (Cal-IPC 2006):

Weed Species	Habitats, Range, and Control Notes	Rankings	Likelihood of Occurrence at DHSP	Consequences of occurrence/ spread
<i>Centaurea melitensis</i> , <i>C. solstitialis</i> Annual star-thistles	Widespread and abundant in W Calif.; new introductions are probably chronic in region; spread may be limited in low desert by soils and climate	CDFA: varies by species Cal IPC: Moderate-High Impacts/ Invasiveness/ Distribution: B/B/B	Moderate (periodic introductions are likely; potential for localized establishment in low density infestations)	Probably minimal consequence for low-density infestation; high-density infestation could cause further invasion in surrounding habitat
<i>Cynodon dactylon</i> Bermuda grass	Widespread and abundant in much of Calif.; new introductions are probably chronic in region; in deserts, requires mesic soil conditions	CDFA: C Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/B	Moderate (periodic introductions are likely; potential for localized establishment in periodically mesic places such as evaporation pond margins, leaking tanks)	Potential for spread off-site along road margins; spread limited by well-drained soils and arid climate
<i>Erodium cicutarium</i> Redstem filaree	Ubiquitous and often abundant or dominant throughout region and throughout most of S Calif.	CDFA: n/a Cal IPC: Limited Impacts/ Invasiveness/ Distribution: C/C/A	Occurs on the site and throughout the region	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat
<i>Halogeton glomeratus</i> Halogeton	Widespread in arid regions of Calif and other western states; apparently spreading; to date, generally not invasive on well-drained bajada soils	CDFA: A Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/A/B	Moderate (periodic introductions are likely; potential for localized establishment in periodically mesic places such as evaporation pond margins, leaking tanks)	Potential for spread off-site along road margins; spread limited by well-drained soils and arid climate
<i>Hirschfeldia geniculata</i> Summer mustard; short-pod mustard	Widespread and often abundant throughout much of Calif., including deserts;	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/A	High (not reported on site, but expected in surrounding area and likely to be introduced to the site)	Minimal consequence for low-density infestation; high-density infestation could cause further invasion in surrounding habitat
<i>Hordeum</i> spp. Hare barley, Mediterranean barley	Widespread and often abundant throughout much of Calif.; less invasive in well-drained desert bajadas	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/A	High (periodic introductions are likely; potential for localized establishment on roadsides or periodically mesic places such as evaporation pond margins, leaking tanks)	Potential for spread off-site along road margins; spread limited by well-drained soils and arid climate
<i>Pennisetum setaceum</i> Fountain grass	Widely planted as an ornamental, and spreading throughout S. Calif. in surrounding habitats	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/B	High (periodic introductions are likely; ongoing potential for establishment on the site)	High; actively spreading in low desert region surrounding areas of persistent sources, e.g., Coachella Valley

Table 1. Weeds of the Chuckwalla Valley Area.

Weed Species	Habitats, Range, and Control Notes	Rankings	Likelihood of Occurrence at DHSP	Consequences of occurrence/ spread
<i>Alhagi pseudalhagi</i> Camel thorn	Widespread in California, many habitats, generally controlled by eradication efforts but new infestation sources are abundant in surrounding states	CDFA: A Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/B	Currently low, but may be introduced via vehicles or other vectors from surrounding areas; potential to colonize and infest in periodically mesic places (e.g., evaporation pond margins, leaking tanks)	Unknown likelihood of spread in arid bajada soils; high potential resource damage.
<i>Avena</i> spp. Wild oat	Widespread and abundant in W Calif.; less common in deserts; new introductions are probably chronic in region; spread limited in low desert by soils and climate	CDFA: n/a Cal IPC: Moderate Impacts/ Invasiveness/ Distribution: B/B/A	High (generally in low numbers)	Low likelihood for spread, low consequences from low-level infestations
<i>Brassica tournefortii</i> Saharan mustard	Widespread and abundant in Calif. deserts; common in interior valleys (e.g., W Riverside Co.); especially invasive in open sands and in disturbed soils (including natural disturbance)	CDFA: n/a Cal IPC: High Impacts/ Invasiveness/ Distribution: A/A/B	Occurs on the site and throughout the region	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in local naturally disturbed soils such as washes and windblown sand.
<i>Brassica</i> spp., Other non-native mustards	Widespread and abundant in W Calif.; less common in deserts; new introductions are probably chronic in region; spread limited in low desert by soils and climate	CDFA: n/a Cal IPC: Moderate-High Impacts/ Invasiveness/ Distribution: vary by species	High (generally in low numbers)	Low likelihood for spread, low consequences from low-level infestations
<i>Bromus madritensis</i> ssp. <i>rubens</i> Red brome	Ubiquitous and often abundant or dominant throughout region and throughout most of Calif.	CDFA: n/a Cal IPC: High Impacts/ Invasiveness/ Distribution: A/B/A	Occurs on the site and throughout the region	Minimal consequence for chronic low-density infestation; high-density infestation could cause further invasion in surrounding habitat
<i>Bromus</i> spp. Other non-native brome grasses	Widespread and abundant in W Calif. or at higher elev. or latitude in deserts; new introductions are probably chronic in region; spread limited in low desert by soils and climate	CDFA: n/a Cal IPC: Moderate-High Impacts/ Invasiveness/ Distribution: vary by species	High (generally in low numbers)	Low likelihood for spread, low consequences from low-level infestations

grass, red brome, redstem filaree, Saharan mustard, London rocket, and Russian thistle. These and other species with potential of occurring on the site now or in the future are listed in Table 1.

Table 1 presents threat rankings for each species as assigned by the CDFA and by Cal IPC (as applicable). Species were selected for inclusion in the table based on occurrence on or around the DHSP site and gen-tie alignments, or from comparable upland bajada habitats of the broader Colorado Desert region in California.

Two CDFA Class C weeds (Russian thistle and Mediterranean split grass) occur on the site and throughout the local area. No CDFA Class A or Class B weeds have been documented on the site.

BLM Risk Assessment guidelines recommend ranking risks according to (1) likelihood that a weed will spread to the project site, and (2) consequences of its establishment on the site.

BLM's recommended assessment of the first factor (likelihood of spread to the site) range from "none" to "high," based on occurrence and abundance in the surrounding area. However, these guidelines do not account for potential weed introduction via vehicle traffic from outside a project the area, and therefore do not address the most likely vector for weed introduction onto the DHSP site. For most weed species below, the likelihood of spread to the project site from adjacent areas is low or none (the only exceptions are those species already occurring on the DHSP site). However, any of these species, as well as species of unknown threat, could be spread to the project area by vehicle traffic during project construction, operation, or decommissioning. The most likely vector would be via seed or rhizomes that may be caught in the undercarriages of construction equipment.

Similarly, the BLM guidelines addressing consequences of establishment primarily refer to on-site consequences. These guidelines appear to address local habitat or range improvement projects, rather than land use conversions to renewable energy facilities. Whereas many weed infestations could degrade a range project, most weed infestations would have only minimal consequences for the solar facility. For the DHSP project, the most important consequences of any potential weed infestation is the likelihood that infestations may spread off the site and into surrounding natural landscapes, possibly including designated critical habitat for desert tortoise, or into Joshua Tree National Park (JTNP).

Due to the general inapplicability of the BLM guidelines to renewable energy land use conversion, the descriptions of likelihood of occurrence at the DHSP and consequences of occurrence/spread in Table 1 are based upon field experience on the site and throughout the Colorado Desert in California, rather than the BLM's recommended risk assessment methodology.

Human activities such as transportation and trade provide a constant source of new exotic species into California, including the Colorado Desert region, and serve to disperse exotic species already established into new areas. We cannot predict what new weed species might become problematic on the DHSP site or the surrounding area in coming decades. Therefore, the monitoring section of this IWMP includes measures to identify and control (generally by eradication) any non-native species new to the area that may be discovered on the site.

Prevention. This IWMP seeks to prevent weeds already present on the site from becoming larger or more persistent infestations, and to prevent new weeds from becoming established on the site.

Detection/identification. The monitoring measures described in this plan are designed to identify weed infestations for further control efforts.

Control. Control strategies will be based on the potential threat of any given infestation. Control strategy will be based on the threat posed by a given weed species, and the location, abundance and extent of the infestation. For each infestation, potential control strategies are:

- *Eradication.* This control objective is to eliminate all individuals of a particular species within a specified area. This will be the goal for weed species that are new to the area (i.e., unknown threat) or known species posing (1) significant environmental concern; and (2) not already widespread in surrounding landscapes.
- *Suppression.* This objective will be selected for weed species and populations already widespread throughout the region and common on disturbed soils. The objective will be to reduce infestation density and minimize seed production and the threat for off-site spread; but not necessarily to reduce the total area or boundary of the infestation. This strategy will apply to many widely distributed, high-density weeds where eradication is not feasible.
- *Containment.* This objective will be aimed at preventing infestation expansion and spread, and may be conducted with or without any attempt to reduce infestation density. Containment focuses on halting spread until suppression or eradication can be implemented, and is practical only to the extent that the spread of seeds or vegetative propagules can be prevented.

2.0 PROJECT DESCRIPTION

The proposed DHSP is a 150-megawatt solar photovoltaic (PV) renewable energy generating facility and associated generation interconnection (gen-tie) line. The DHSP solar generation facility would be located on BLM-administered land north of Desert Center in Riverside County, and the 12-mile gen-tie line would primarily be on BLM land, with approximately one mile total located on Metropolitan Water District land and Riverside County land. The DHSP has a minimum expected lifetime of 30 years, with an opportunity of 50 years or more with equipment replacement, repowering, and an extension of the applicable permits, approvals and authorizations for the DHSP. Detailed descriptions of the proposed DHSP and alternatives can be found in Chapter 2 of the project's Draft Environmental Impact Statement (DEIS). A detailed description of the habitats found at the site and along the proposed and alternative gen-tie routes can be found in Chapter 3.3 of the DEIS. Figure 2 identifies the project site, the proposed gen-tie (Alternative B) and alternative routes, and the vicinity of the project area. Figures 3 and 4 identify the distribution of vegetation at the project site and gen-tie routes, respectively.

3.0 KNOWN AND POTENTIAL WEED OCCURRENCES

Within the project study area, the overall prevalence of invasive plant species is low, generally consistent with undisturbed desert bajadas and uplands throughout the region. Invasive plant species that have been found on the solar facility site and in the surrounding areas include Mediterranean split

1.0 INTRODUCTION

enXco proposes to develop the Desert Harvest Solar Project (DHSP) on 1,208 acres of public lands administered by the Bureau of Land Management (BLM) in unincorporated Riverside County, approximately 6 miles north of Desert Center, California (Figure 1; all figures are in Appendix A). The BLM and the County of Riverside are reviewing the Project, pursuant to the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) (BLM 2011a).

This Integrated Weed Management Plan (IWMP) describes the proposed DHSP Project activities and components that may facilitate weed infestations; summarizes baseline data regarding weeds in the project vicinity; assesses potential risks that weeds may pose to natural resources values on the project site and in the surrounding area that could result from project construction, operation, and decommissioning; and describes monitoring and control measures to be implemented to minimize those risks.

Throughout this IWMP, the word “weed” is used to include any non-native plant that may interfere with natural resource values on the DHSP site or on surrounding lands. The most important effect of weeds on natural resources is invasion into natural habitats. Invasive weeds can displace native species, supplant food plants or other wildlife habitat elements (e.g., cover), alter natural habitat structure and ecological function, alter natural wildfire patterns, or displace special-status plant occurrences and habitat (Zouhar et al. 2008; Lovich and Bainbridge 1999). Due to this damage to habitat and natural systems, these plants are considered “weeds” or “pest plants” when they invade natural landscapes (Bossard et al. 2000). The spread of invasive plants is an important threat to biological resources in the California desert. Human activities, including the proposed DHSP, can affect weed distribution and abundance in two ways: they can introduce new weed species to an area, and they can facilitate propagation and spread of weeds already present.

Weeds and pest plants addressed in this IWMP will not be limited to “noxious weeds” as designated by federal and state agencies. Instead, weeds are defined here to include any species of non-native plants identified on the weed lists of the California Department of Food and Agriculture (CDFA), the California Invasive Plant Council (Cal IPC), or of special concern identified by BLM. In addition, any non-native species found on the site that has not been evaluated for its potential to invade or alter surrounding natural lands will be considered a weed for purposes of IWMP implementation.

Numerous invasive weeds have already become widespread throughout the Colorado Desert and for some invasive species the prevention of further spread is impracticable. Examples of these species include Mediterranean split grass (*Schismus* spp.), Russian thistle (*Salsola tragus*), and Saharan mustard (*Brassica tournefortii*). Others (e.g., saltcedar, *Tamarix ramosissima*) are damaging to specific habitat types but pose little or no threat to widespread upland desert habitat.

Within the project study area, the overall prevalence of invasive species is low, generally consistent with undisturbed desert bajadas and uplands throughout the region. Invasive plant species that have been found on the solar facility site and in the surrounding areas include Mediterranean split grass, red brome (*Bromus madritensis* ssp. *rubens*), redstem filaree (*Erodium cicutarium*), Saharan mustard, London rocket (*Sisymbrium irio*), and Russian thistle.

1.1 Integrated Weed Management Plan Objectives

Weed management objectives for DHSP include the following:

ABBREVIATIONS AND ACRONYMS

Best Management Practices	BMPs
Bureau of Land Management	BLM
California Department of Food and Agriculture	CDFA
California Department of Fish and Game	CDFG
California Environmental Quality Act	CEQA
California Invasive Plant Council	Cal IPC
Desert Harvest Solar Project	DHSP
Draft Environmental Impact Statement	DEIS
Generation interconnection line	gen-tie line
Global positioning system	GPS
Integrated Weed Management Plan	IWMP
Joshua Tree National Park	JTNP
Material safety data sheets	MSDS
Miles per hour	mph
Mitigation Measure	MM
National Environmental Policy Act	NEPA
Pesticide Application Record	PAR
Pesticide Use Proposal	PUP
Programmatic Environmental Impact Statement	PEIS
Photovoltaic	PV
Right-of-way	ROW
Standard Operating Procedure	SOP
Surface Water Protection Plan	SWPP
United States Environmental Protection Agency	EPA
United States Fish and Wildlife Service	USFWS

Table of Contents

1.0 INTRODUCTION	1
2.0 PROJECT DESCRIPTION	2
3.0 KNOWN AND POTENTIAL WEED OCCURRENCES	2
4.0 DESIGNATED BIOLOGIST RESPONSIBILITIES	7
5.0 PREVENTION	7
6.0 MONITORING	9
6.1 WEED IDENTIFICATION, MAPPING, AND DATA MANAGEMENT	9
6.2 SCHEDULING AND FIELD METHODS	10
7.0 WEED CONTROL	11
7.1 CONTROL STRATEGIES AND PRIORITIZATION	11
7.2 MECHANICAL CONTROL	11
7.3 OVERVIEW OF CHEMICAL CONTROL	12
7.4 PROPOSED HERBICIDE APPLICATION	16
7.5 POTENTIAL EFFECTS OF HERBICIDE USE	19
8.0 REPORTING	19
9.0 LITERATURE CITED	20

TABLES

Table 1. Weeds of the Chuckwalla Valley Area.

Table 2. Herbicide Application Matrix.

FIGURES

Figure 1. Regional Map.

Figure 2. Project and Vicinity.

Figure 3. Vegetation: Project Site.

Figure 4. Vegetation: Gen-Tie Line Alignments.

Appendices

Appendix A. Figures.

Appendix B. Approved Herbicides and Adjuvants.

Appendix C. Example California BLM Pesticide Use Proposal.

Appendix D. Example California BLM Pesticide Application Records Form.

Draft Integrated Weed Management Plan

Desert Harvest Solar Project

Prepared for:



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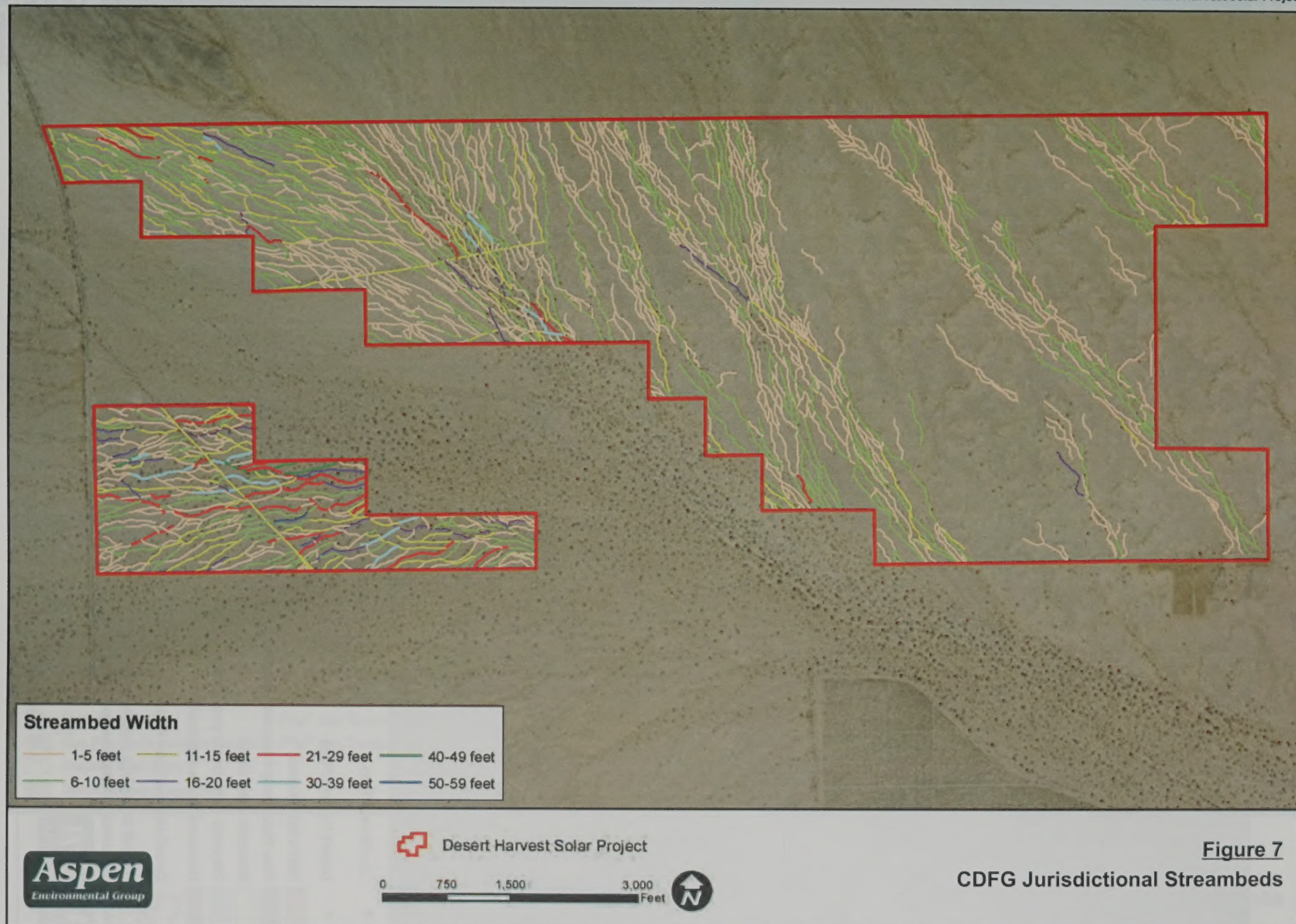


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April, 2012

Appendix C.10

Draft Integrated Weed Management Plan



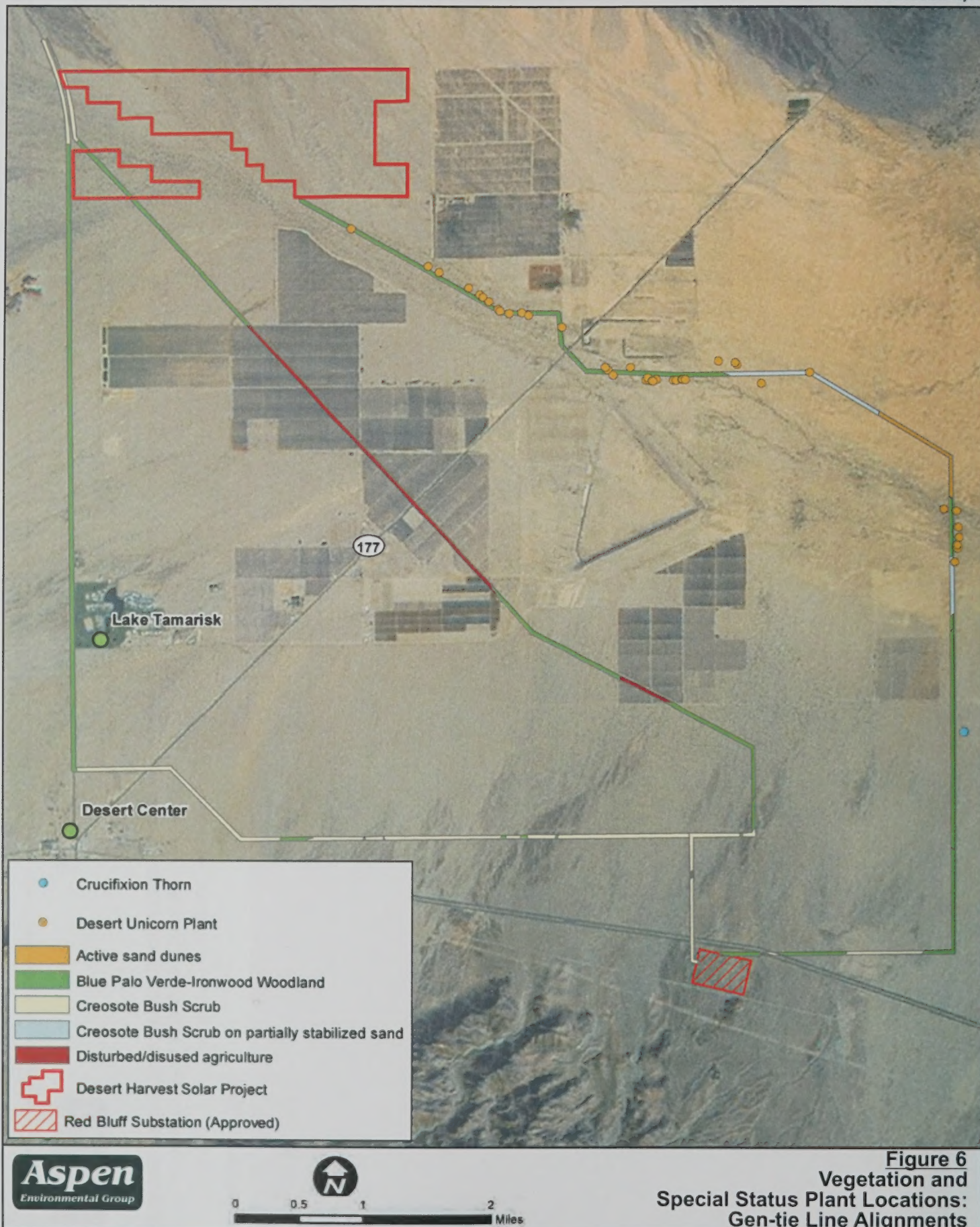
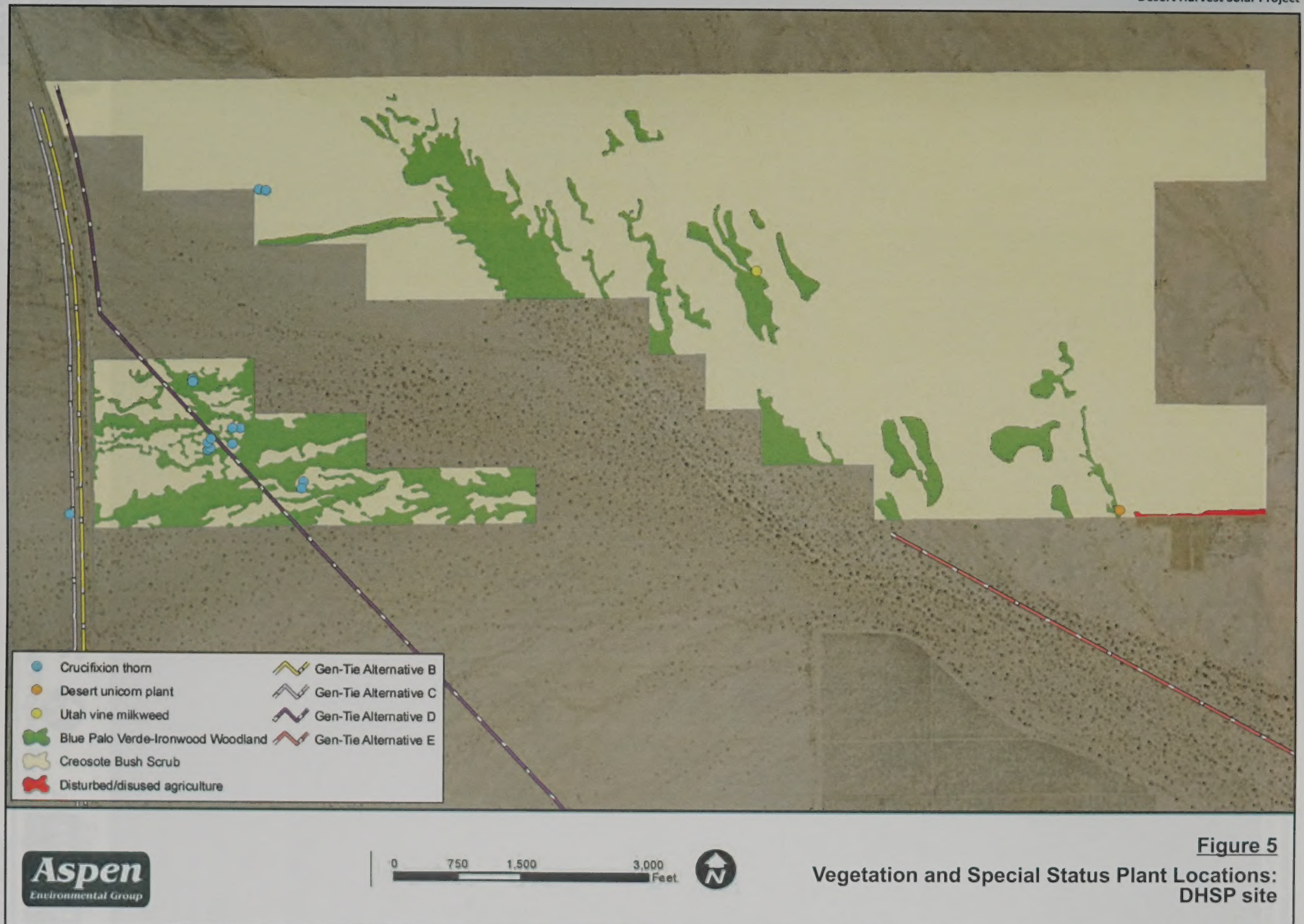
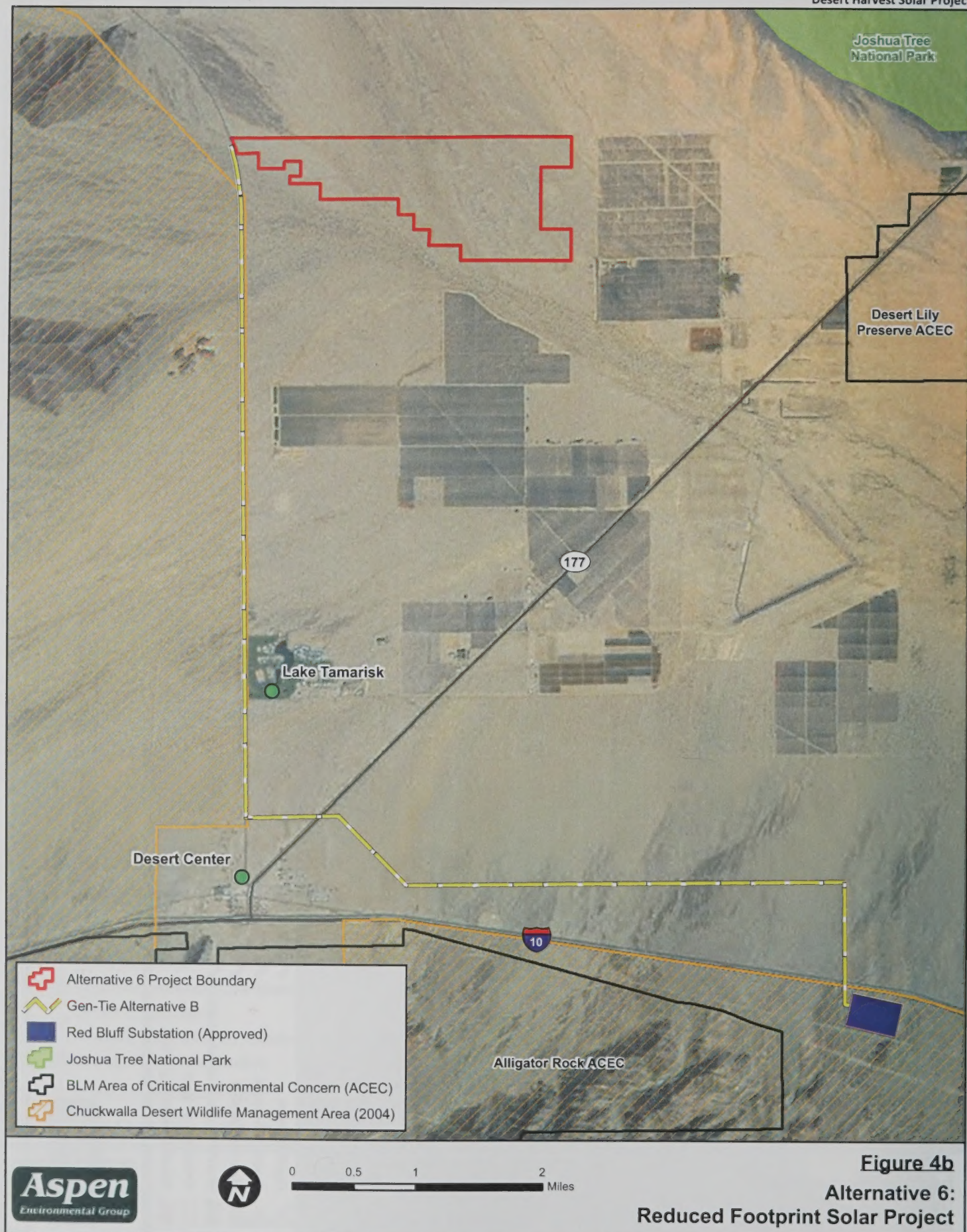
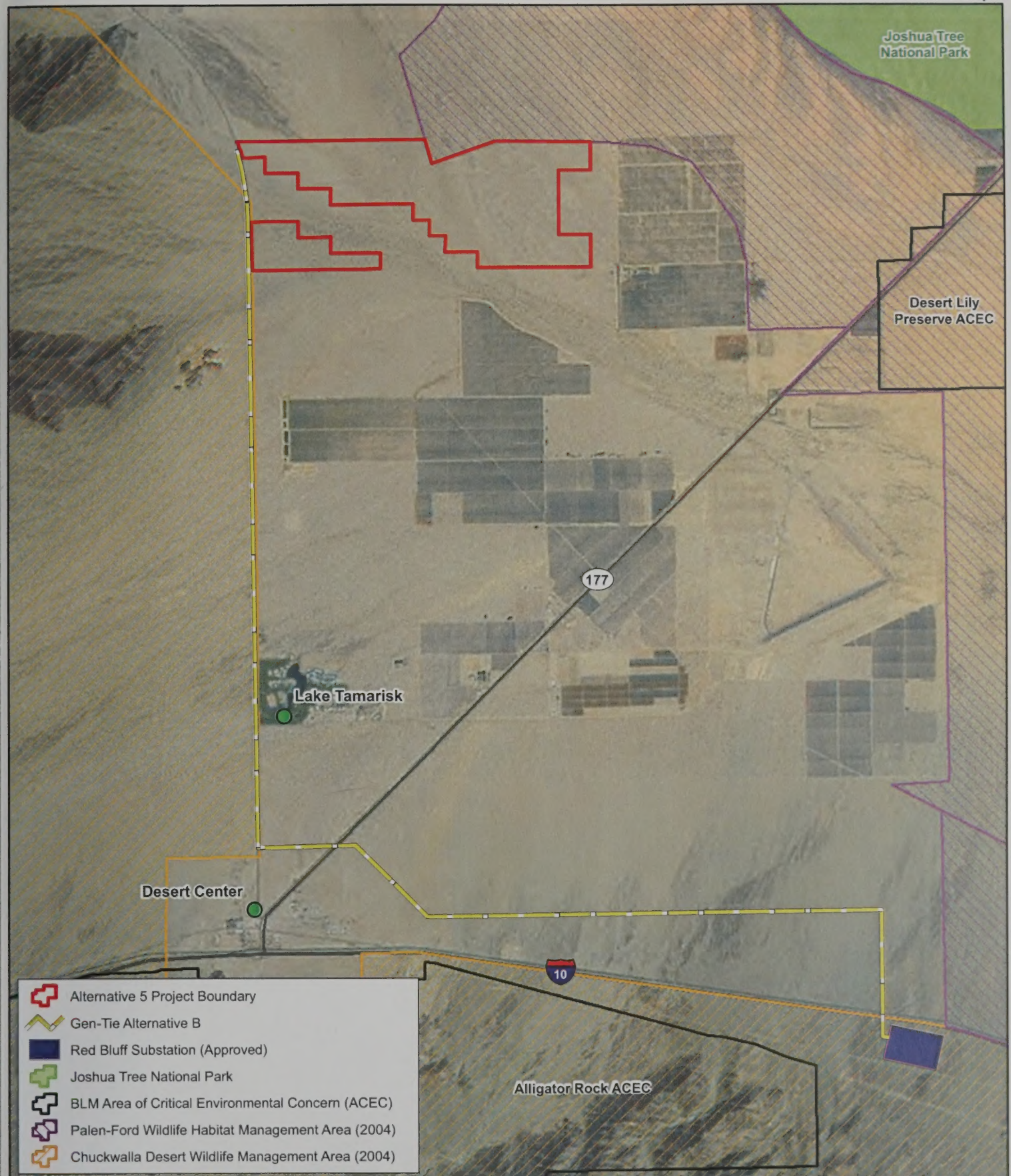


Figure 6
Vegetation and
Special Status Plant Locations:
Gen-tie Line Alignments







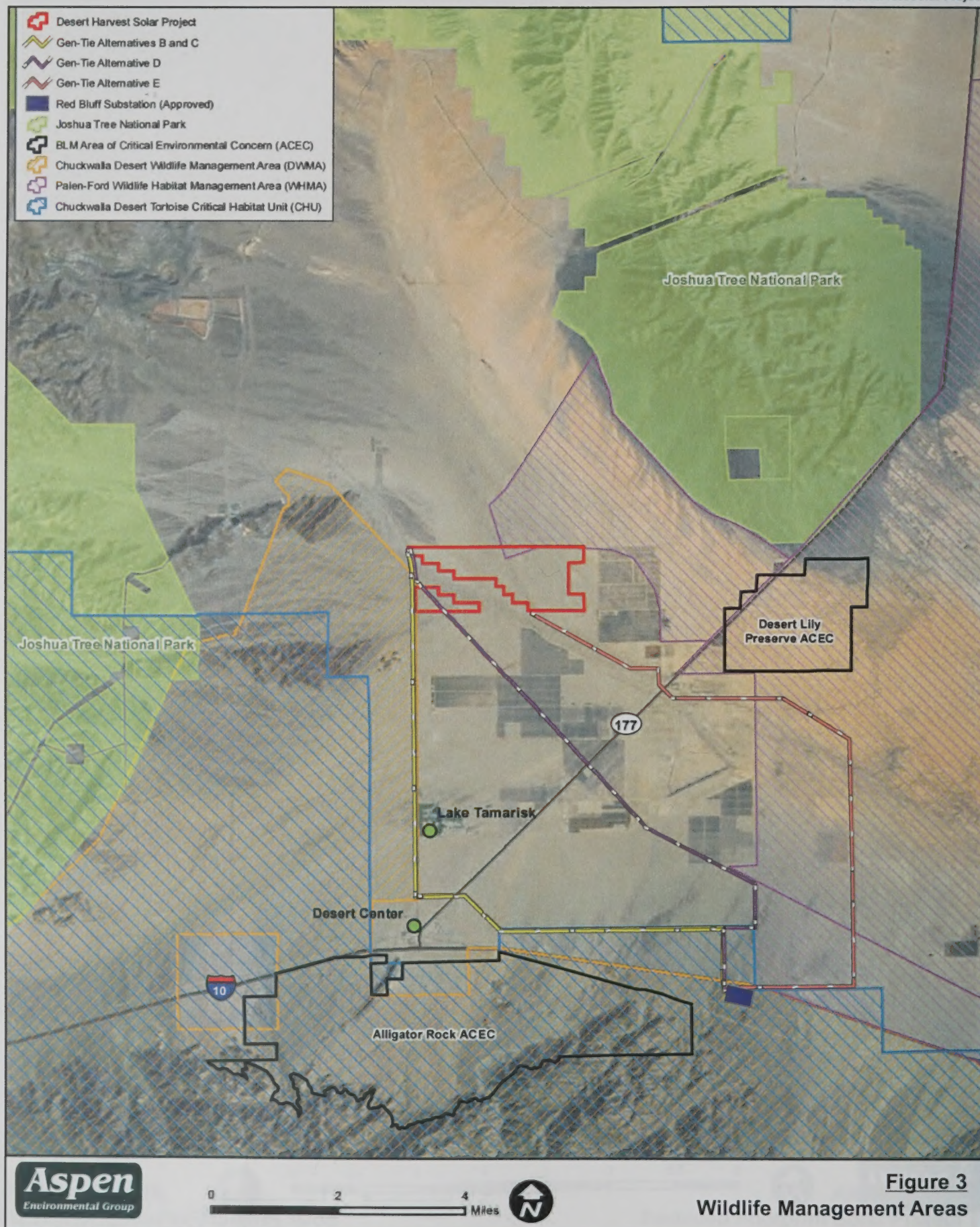


Figure 3
Wildlife Management Areas



Figure 2
Project and Vicinity



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8.0 ADAPTIVE MANAGEMENT

enXco will implement adaptive management measures during the O&M project phase as appropriate to minimize risks to birds and bats. There is no available baseline data regarding bird or bat mortality at industrial scale PV solar plants in the California desert. enXco will coordinate with USFWS, BLM, and CDFG to review the project's monitoring data and establish thresholds for implementation of adaptive management measures.

The primary potential for risk to birds and bats during project O&M are likely to be mortality or injury by striking PV panels, and nest failure that may result if nests are built on project components (e.g., PV panel support structures) that become vulnerable to disturbance during maintenance or other project activities.

Examples of potential adaptive management measures that may be taken include the following:

- Installation of visual screening on the perimeter fence, to minimize that likelihood that shrubland birds and bats would be attracted into the facility;
- Modifications to support structures or other facilities to exclude nesting birds (e.g., netting or shielding around framework; capping open pipes or tubing);
- Seasonal modifications to panel washing and maintenance schedules, or pre-washing inspections, to prevent damage to bird nests; or
- Visual or auditory deterrents to prevent birds or bats from accessing evaporation ponds or netting over the ponds.

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or the surrounding 500 foot buffer area, during nesting seasons during the construction or decommissioning phases of the project. For burrowing owls, the monitoring plan will apply to active burrows year-around during the construction or decommissioning phases. enXco will document the results of nest and burrow monitoring, including the locations and species of all nests located during field surveys, any buffer areas or other protection measures taken for each nest, and the outcome for each nest (e.g., nest abandonment, predation, or date of fledging). These results will be compiled in regular monitoring reports and provided to the USFWS.

O&M phase nest monitoring. enXco will contract with a qualified biologist to prepare and implement a monitoring plan to evaluate bird nesting activity within the project area or on the gen-tie alignment during the O&M phase of the project. The purpose of the nest monitoring will be to determine which species (if any) use the project facility for nesting, which specific structures (e.g., support framework beneath PV panels, other structures on the site, or open ground among panels) are used as nest sites, and whether the project components attract birds to unsuitable or hazardous nest sites.

O&M phase mortality monitoring. enXco will contract with a qualified biologist to prepare and implement a monitoring plan to evaluate bird and bat mortality within the project site. Examples of potential bird or bat hazards include, but are not limited to, striking the PV panels or other project components, and entanglement in netting at the evaporation pond.

Golden eagle activity. The USFWS has recommended that enXco obtain 3 years of nesting season and winter season golden eagle activity data for a 10-mile radius area surrounding the project site. To date, enXco has obtained 2010 breeding season data in the area from the Desert Sunlight EIS (BLM 2011b) and supporting documents. No winter or breeding season data on golden eagle activity were collected in the area during 2011. The Desert Sunlight project owner is required by Mitigation Measure WIL-6 of the Desert Sunlight FEIS, to obtain breeding season golden eagle activity over the same area each year throughout the active construction phase for that project. These data sets will provide breeding season golden eagle activity for the 2012 and 2013 breeding season throughout the recommended 10-mile radius surrounding the DHSP site.

enXco will contract with a qualified golden eagle biologist to conduct winter season surveys for golden eagle activity in a 10-mile radius of the Desert Harvest project site. Surveys will begin in December 2011 and continue over an 8-week period. During each survey all accessible roads in the study area will be traveled via automobile, with random stops to check the horizon for eagles with binoculars and high powered scopes. All transmission line towers and pole lines in the study area will also be checked on each survey, as well as all historic cliff nest territories.

These surveys, in combination with the Desert Sunlight nesting season data from 2010 and 2012 will serve as the baseline golden eagle data for both projects. enXco anticipates that project construction, and construction-phase golden eagle activity monitoring, will be underway by winter 2012. At that point, continued monitoring will be implemented, consistent with the requirements of Mitigation Measure WIL-5.

enXco confirms its commitment to conduct a winter non-nesting survey in 2011-2012. Beyond that, enXco understands there to be four projects in the Chuckwalla Valley that are studying essentially the same foraging and nesting area for golden eagles. The Desert Sunlight project must conduct two additional breeding-season surveys, for example, and the eastern portions of those surveys overlap with the Palen project's golden eagle surveys. enXco will coordinate with the USFWS to assess golden eagle occurrence throughout the area, and to evaluate effects of the DHSP. Future surveys will be scheduled to avoid duplication of effort and to minimize disturbance to golden eagles.

adaptive management actions, to include, but not be limited to, cessation of construction activities that are deemed by the Designated Biologist to be the source of golden eagle disturbance.

MM WIL-6: Bird and Bat Conservation Plan. This measure requires that the project owner prepare and implement a Bird and Bat Conservation Strategy (formerly titled Avian and Bat Protection Plan) in consultation with the USFWS. This Draft BBCS was prepared in anticipation of MM WIL-6, to conform to the recommendations of the USFWS (2010b).

7.0 MONITORING AND REPORTING

7.1 BIRD AND BAT MONITORING REQUIREMENTS OF THE DEIS

Several of the mitigation measures summarized above specify monitoring and reporting requirements. The appointed Designated Biologist will be responsible for monitoring and reporting on biological resources for project activities, beginning during pre-construction surveys and continuing through the construction, O&M, and decommissioning project phases. Specific monitoring requirements related to bird and bat conservation are the following:

MM VEG-2. The Designated Biologists will report all special-status species observations to the CNDDB and include scopes of these reports in monthly or quarterly monitoring reports, and immediately report any dead or injured listed threatened or endangered species to the Wildlife Agencies.

MM WIL-3. The Designated Biologist or Biological Monitor shall monitor bird nests located during pre-construction surveys until nestlings have fledged and dispersed; shall monitor work areas, including active work areas, throughout the breeding season each year, throughout the construction, O&M, and decommissioning phases of the project; and nest locations, project activities in the vicinity of nests, and any adjustments to buffer areas shall be described and reported in regular monitoring and compliance reports.

MM WIL-4. If burrowing owls are passively relocated, the relocation plan will include a monitoring and reporting component.

MM WIL-5. Annual monitoring of breeding season and winter season golden eagle activity within a 10-mile radius of the project site and gen-tie alignment, beginning in winter 2011-12 and continuing throughout the construction phase of the project. The intent of this monitoring will be to expand the existing baseline data and document local golden eagle activity during throughout the period when construction activity may affect nesting or wintering golden eagle behavior. MM WIL-5 also requires monitoring and adaptive management if an occupied nest is detected within 10 miles of the project site or gen-tie line alignment.

7.2 DESERT HARVEST BIRD AND BAT MONITORING APPROACH AND STRATEGY

enXco will implement avian and bat monitoring programs consistent with the mitigation measures, summarized above, as follows:

Construction and decommissioning phase nest monitoring. enXco will contract with a qualified biologist to prepare and implement a nest monitoring plan for any bird nests within the project footprint

MM WIL-1: Wildlife Impact Avoidance and Minimization. MM WIL-1 requires a variety of measures to avoid or minimize impacts to wildlife and habitat, including minimization of disturbance areas; roads; vehicle traffic; soil erosion; dust. It also requires avoidance of wildlife pitfalls or other potential entrapments; avoidance of toxic materials on unpaved road surfaces; minimization of standing water and other potential predator subsidies; and covering the evaporation ponds.

MM WIL-3: Pre-Construction Nest Surveys and Impact Avoidance Measures for Migratory and Nesting Birds. Pre-construction nest surveys for nesting birds shall be conducted prior to any construction activities that will occur during the breeding period (from February 1 through August 31). Additional specifications include:

- Coverage area to include the project site or other work areas and a 500-foot buffer;
- At least two pre-construction surveys, separated by a minimum 10-day interval; the second survey to be no more than 10 days before construction starts. Additional follow-up surveys may be required if periods of construction inactivity exceed one week in any given area;
- Reporting on survey results prior to start of construction;
- A 330-foot radius buffer zone surrounding the nests where no impacts to soils or vegetation will be permitted while the nest remains active. For any active raptor nests or bat maternity roosts, the flagged buffer zone/avoidance area shall be a 1200-foot radius surrounding the nest or roost site. This protected area surrounding the nest may be adjusted by the Designated Biologist in consultation with BLM, Riverside County, CDFG, and USFWS;
- Monitoring of any active nests within or adjacent to the work areas; until nestlings have fledged and dispersed. Activities that might, in the opinion of the Designated Biologist, disturb nesting activities shall be prohibited within the buffer zone until such a determination is made;
- Ongoing breeding-season monitoring of work areas, throughout the construction, O&M, and decommissioning phases of the project; and
- Reporting on nest locations, project activities in the vicinity of nests, and any adjustments to buffer areas shall be described and reported in regular monitoring and compliance reports described in MM VEG-2.

MM WIL-4: Burrowing Owl Impact Avoidance, Minimization, and Compensation Measures. This measure requires pre-construction surveys for burrowing owls; avoidance measures to and buffer areas surrounding active burrows; compensation of 19.5 acres of land for each burrowing owl or breeding pair that is displaced by construction (may be “nested” within compensation lands, per MM VEG-6); and passive relocation of burrowing owls, outside the nesting season only.

MM WIL-5: Golden Eagle Pre-construction and Construction Phase Surveys. The project owner shall contract with a qualified ornithologist to conduct winter season and nesting season surveys of golden eagle habitat use in Chuckwalla Valley and surrounding mountains within a 10-mile radius of the project site and gen-tie alignment, beginning in winter 2011-12, continuing throughout the construction phase of the project. Survey methods for the inventory shall be either ground-based or helicopter-based, as described in the *Golden Eagle Technical Guidance* (Pagel et al., 2010) or more current guidance from the USFWS. If an occupied nest is detected within 10 miles of the project site or gen-tie line alignment, the project Owner shall prepare and implement a Golden Eagle Monitoring and Management Plan for the duration of construction to ensure that project construction activities do not result in injury or disturbance to golden eagles. The Monitoring and Management Plan shall include a description of

with respect to design, operation, and maintenance, protection of migratory waterfowl, and raven management.

6.2 DEIS MITIGATION MEASURES

The DHSP DEIS will recommend additional mitigation measures to expand upon applicant's proposed measures above. The full text of each measure may be found in Sections 4.3 and 4.4 of the DEIS. The measures that relate to bird and bat conservation are listed and briefly summarized below.

MM VEG-1: Assign a Designated Biologist and Biological Monitors. The project owner will identify a Designated Biologist throughout the construction, O&M, and post-project decommissioning phases, and any subsequent monitoring/reporting period. MM VEG-1 describes the Designated Biologist's required qualifications, and responsibilities for monitoring, inspection, and reporting. The Designated Biologist also will be responsible for training and supervising Biological Monitors, who will be appointed as needed for the construction, O&M, and decommissioning phases of the project. The Designated Biologist will be the primary point of contact for resource agency communications.

MM VEG-2: Conduct Biological Monitoring and Reporting during Project Construction, Operations, and Decommissioning. The Designated Biologist and Biological Monitors shall ensure that construction activities are consistent with the adopted mitigation measures, and avoid disturbance to any habitat outside permitted work areas. The Designated Biologist shall have the authority and responsibility to immediately halt any project activities that are not in compliance with mitigation measures, or to order any reasonable measure to avoid take of a listed species.

The project Owner shall be responsible for ensuring that construction monitoring is conducted during all project phases. During the O&M phase, the reporting schedule will be quarterly rather than monthly. The Designated Biologist will report all special-status species observations to the CNDDDB and include copies of these reports in monthly or quarterly monitoring reports.

MM VEG-3: Prepare and Implement a Worker Environmental Awareness Program (WEAP). The project owner shall prepare and implement a project-specific WEAP to be administered to all on-site personnel. The WEAP shall address conservation and protection requirements for biological resources.

MM VEG-4: Minimize Construction-Related Impacts. Project design shall minimize temporary construction work areas to the extent feasible and minimize the impacts to native vegetation and habitat.

MM VEG-5: Prepare and Implement a Vegetation Resources Management Plan. The Vegetation Resources Management Plan shall detail the methods for revegetation of temporarily impacted sites; salvage of cacti and special-status plants from the project footprint; and long-term management of vegetation within the solar facility during its operations.

MM VEG-6: Provide Off-Site Compensation for Impacts to Vegetation and Habitat. This mitigation measure provides further detail and specificity to the habitat compensation requirements described in AM-BIO-1. The measure includes compensation ratios for vegetation types and land use designations, ranging from 1:1 for upland creosote bush scrub, to 5:1 for lands within designated DWMA's, WHMA's, or desert tortoise critical habitat. The measure also specifies selection criteria, to address habitat values and biological connectivity. The compensation lands must be protected and managed in perpetuity for biological resource values, and the project owner must provide funding as described in MM VEG-6 for this long-term management.

woodland, and jurisdictional resources. Compensation will be accomplished by acquisition of mitigation land or conservation easements or by providing funding for specific land acquisition, endowment, restoration, and management actions under one of several programs, such as the recently approved mitigation program created by AB 13. The Habitat Compensation Plan will be reviewed and approved by BLM, United States Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG). The precise details of the mitigation, including mitigation ratios, will be established in the BLM Right-of-Way (ROW) grant, USFWS Biological Opinion, and any CDFG 2081 Incidental Take Permit or CDFG 2080.1 Consistency Determination.

AM-BIO 2: Integrated Weed Management Plan. A Draft Integrated Weed Management Plan (IWMP) will be prepared pursuant to BLM's Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007) and the National Invasive Species Management Plan (NISC, 2008), and will be implemented by the Applicant to reduce the potential for the introduction of invasive species during construction, operation and maintenance, and decommissioning of the project. The draft plan will be reviewed and approved by the BLM.

AM-BIO 4: Worker Environmental Awareness Program (WEAP). The Applicant will implement a WEAP to educate on-site workers about sensitive environmental issues associated with the project. The WEAP will be administered to all on-site personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel. The program will be implemented during site mobilization, ground disturbance, grading, construction, operation, and closure. BLM will be responsible for ensuring that each construction worker at the site, throughout the duration of construction activities, receives the above training.

AM-BIO 5: Vegetation Resources Management Plan. The Applicant will prepare and implement a Vegetation Resources Management Plan that contains the following components:

- A Vegetation Salvage Plan which discusses the methods that will be used to transplant cacti present within the project locations following BLM's standard operating procedures, as well as methods that will be used to transplant special-status plant species that occur in the project locations if feasible.
- A Restoration Plan which discusses the methods that will be used to restore creosote bush scrub and desert dry wash woodland habitat that is temporarily disturbed by construction activities.
- The Vegetation Salvage Plan and Restoration Plan will specify success criteria and performance standards. BLM will be responsible for reviewing and approving the plan and for ensuring that the Applicant implements the plan including maintenance and monitoring required in the plan.

AM-BIO 7: Regional Raven Management Program. The Applicant shall contribute to the USFWS Regional Raven Management Program by making a one-time payment of \$105 per acre of project disturbance to the National Fish and Wildlife Federation Renewable Energy Action Team raven control account. A Draft Avian and Bat Protection Plan will be prepared and will be implemented by the Applicant to specify necessary actions to be taken to protect nesting bird and bat species, including burrowing owls, nesting birds, and roosting bats. The Draft Plan will be reviewed and approved by BLM. The Final Plan will conform to the 2010 USFWS avian and bat guidelines entitled Considerations for Avian and Bat Protection Plans U.S. Fish and Wildlife Service White Paper.

AM-BIO 8: Construction Water Storage Pond Design. The temporary construction water ponds shall be designed, constructed, and operated in compliance with all applicable regulatory requirements

loss of foraging habitat. Mitigation Measures MM WIL-5 (Golden Eagle Pre-construction and Construction Phase Surveys) requires pre-construction and construction phase surveys to ensure that project construction activities do not result in injury or disturbance to golden eagles. Implementation of these measures would substantially reduce the Proposed Action's contribution to cumulative impacts to golden eagles.

Burrowing Owl. The DHSP would contribute incrementally to the cumulative loss of burrowing owl wintering and breeding habitat. Habitat on site and along most of the gen-tie alternative alignments appears suitable for nesting and wintering. Impacts of the DHSP would be similar to other solar developments in the region, and could include loss of breeding or wintering habitat, disturbance due to human activities, and destruction of active (nesting or wintering) burrows. However, due to the low level of use, and an apparent rarity of breeding on-site, the incremental contribution of the Proposed Action or Alternatives to cumulative impacts to burrowing owls would be minor. Implementation of mitigation measures would reduce the DHSP's contribution to cumulative impacts.

Other Special-Status Birds. The DHSP would contribute incrementally to the cumulative loss of habitat for several special-status birds. The DHSP's primary impacts to resident and migratory birds include habitat loss, disturbance to foraging and breeding, and risk of injury or mortality due to collision with project features. However, due to the availability of similar habitat in the greater Chuckwalla Valley and beyond, the DHSP's incremental contribution to cumulative impacts to resident and migratory birds would be low. This contribution would be further reduced by the implementation of mitigation measures (below).

Special-Status Bats. Bats may forage over the project area, and may be drawn to the area by the storage ponds (during construction) or the evaporation pond (during O&M). Due to the lack of extensive or high-quality roosting habitat in or near the project area, and the widespread availability of similar foraging habitat in the Chuckwalla Valley and beyond, the incremental contribution of the Proposed Action to cumulative impacts to bats would be minor. This contribution would be further reduced or offset by the implementation of mitigation measures described below.

6.0 CONSERVATION MEASURES

enXco has provided several measures as part of the project description to reduce potential impacts to biological resources, including birds and bats. These measures have been adopted into the project DEIS by incorporating them into project-specific mitigation measures proposed in Sections 4.3 and 4.4. Additional mitigation measures proposed in the DEIS encompass the substance and intent of the applicant-proposed measures, but clarify or expand on reporting requirements, timing of implementation, or other details where appropriate. Where there is a conflict between provisions of the applicant's proposed measures and the DEIS's recommended mitigation measures, the DEIS mitigation measures take precedence.

6.1 APPLICANT PROPOSED MEASURES

Applicant-proposed measures identified by enXco to reduce impacts to biological resources include the following:

AM-BIO 1: Habitat Compensation Plan. A Habitat Compensation Plan is being prepared and will be implemented by the Applicant to compensate for the loss of creosote desert scrub, desert dry wash

and cause dust or health impacts to wildlife in surrounding habitat. Mitigation Measure MM WIL-1 would minimize this effect by ensuring that salt sediment is promptly removed at regular intervals from the evaporation pond.

Predator subsidies. Project construction, operation, and decommissioning activities could provide resources in the form of trash, litter, or water, which attract and subsidize unnaturally high numbers of predators such as common ravens, coyotes, and feral dogs. This influx of predators could cause unnaturally high predation pressure on wildlife species in the vicinity. Ravens are opportunistic omnivores and they prey on the eggs and nestlings of native birds, among many other food sources (Zeiner et al. 1990), including juvenile desert tortoises. Ravens and coyotes habituate to human activities and are subsidized by food (trash, road killed animals), water (irrigation or dust control overspray), and (for ravens) new perching, roosting, and nesting sites (transmission line structures and other structures) that are introduced or augmented by human encroachment.

Mitigation Measure WIL-8 (Raven Monitoring, Management, and Control Plan) would require management of all potential predator subsidies, monitoring of raven presence and abundance, control measures as needed, and contribution to the region-wide Raven Management Program.

5.9 CUMULATIVE IMPACTS

The development of numerous large-scale renewable energy projects, including the DHSP and other solar and wind projects in the region, would result in a substantial permanent conversion of desert habitat to industrial and commercial uses. Existing and foreseeable future projects in the NECO planning area (not including the DHSP) would result in the total projected loss of 4.5 percent of the Sonoran Creosote Bush Scrub and 6.5 percent of the Desert Dry Wash Woodland habitat in the NECO planning area (see DEIS Section 4.3.14). This would constitute a substantial cumulative impact to these plant communities and wildlife habitat through direct habitat loss and habitat fragmentation. The DHSP would contribute approximately 0.4 percent to this cumulative impact to Sonoran Creosote Bush Scrub and between 0.9 and 1.2 percent to the cumulative impact to Desert Dry Wash Woodland. The DHSP DEIS concludes that the project would contribute considerably to cumulative impacts to wildlife habitat.

Common Wildlife. The DHSP's incremental contribution to cumulative impacts to common wildlife, including most resident and migratory birds, would be habitat loss and fragmentation. Most common wildlife species range widely over California, and these species have not been identified as conservation priorities. The DHSP would contribute incrementally to impacts to common wildlife such as disruption of movement, disturbance, mortality, loss of habitat, and fragmentation. With the incorporation of recommended mitigation measures, this incremental contribution would be mitigated to the extent feasible and would not result in the loss of a population or a trend toward federal or state listing for any common wildlife species. With incorporated mitigation, the DHSP would not make a considerable contribution to the cumulative regional impacts to common wildlife, when combined with the effects of past and future projects in the NECO planning area.

Golden Eagle. The DHSP would contribute to the cumulative regional loss of golden eagle foraging habitat. Other renewable developments, both existing and proposed, in the NECO planning area would have similar impacts. Cumulatively, development in the California deserts could have substantial impacts to golden eagle foraging habitat if left unmitigated. Most projects are not likely to directly affect golden eagle nesting sites in the desert mountain ranges. Implementation of DHSP mitigation measures would minimize or offset project impacts to golden eagle foraging habitat. Mitigation Measure MM VEG-6, which would require compensatory land acquisition, would offset project-specific

Strategy. Mitigation Measure VEG-6 (below) specifies selection criteria to ensure that compensation habitat adequately offsets the project's impacts to habitat and fragmentation.

5.7 DISTURBANCE DUE TO ONGOING HUMAN PRESENCE AT THE FACILITY

Maximum noise levels during construction are estimated to range from 74.8 to 83.2 dBA at 100 feet from construction activity, and would decrease with distance away from activity. This would be a substantial increase over existing background noise levels near the solar field site, which are expected to be low, with typical daytime noise levels of 35 to 50 dBA. In addition, if construction activities were to occur at night, lighting would be required. Noise and lighting during construction would affect wildlife in adjacent habitats by disrupting foraging, breeding, sheltering, and other activities; or it cause animals to avoid otherwise suitable habitat surrounding the site. The effects of construction noise include annoyance, which causes birds and other wildlife to abandon nests or dens; increased stress hormone levels, interference with sleep and other activities; and interference with acoustic communication by masking important sounds or sound components, such as territorial calls, contact calls, or alarm calls (Dooling and Popper, 2007). Many species rely on vocalizations during the breeding season to attract a mate within their territory, and noise from construction could disturb nesting birds and other wildlife and adversely affect nesting and other activities.

Lighting during project construction may affect nocturnal wildlife species. Lighting can affect behavior and physiology, and may also increase the risk of predation of wildlife because they may be more detectable to nocturnal predators. Lighting would be likely to attract nocturnal insects and, in turn, bats; possibly including special-status bats, discussed further below. Mitigation Measure MM WIL-1 (Wildlife Impact Avoidance and Minimization) and MM VR-6 (Night Lighting Control) would minimize the impacts of noise and lighting by ensuring lighting is focused only on work areas and does not unnecessarily extend beyond work areas, and scheduling noisy construction activities near the project site perimeter outside the most sensitive season.

During operation, some birds and other small wildlife species would re-occupy the solar field site once construction activities are completed, where ongoing O&M noise and lighting may affect them. Noise and lighting may also affect wildlife in the nearby off-site habitat. These effects would be qualitatively similar to the description of construction phase effects of noise and lighting, but would be of lesser magnitude. Mitigation Measure MM WIL-1 (Wildlife Impact Avoidance and Minimization) would minimize these impacts.

5.8 ADDITIONAL RISK FACTORS

Storage ponds. During construction, storage ponds on the site would be used to store water for dust control. These ponds would be within the fenced construction area. Even though they would be fenced, they will be likely to attract birds, including ravens, and thus act as a "subsidy" (see discussion below). Storage ponds would be likely to attract nocturnal insects and, in turn, bats; possibly including special-status bats.

Evaporation ponds. The proposed evaporation ponds could affect birds by posing a drowning hazard; a water subsidy for predators; salt encrustations, which can interfere with flight or other activity; or salt toxicosis (poisoning). Mitigation Measure MM WIL-1 requires covering the evaporation pond to prevent these impacts. If the evaporation pond dries completely at times, residual salts could become airborne

Palo Verde–Ironwood Woodland vegetation on the site may provide marginally suitable Gila woodpecker nesting habitat, and there is a low possibility that it may nest on the site, or that the project site is near an occupied nesting territory. Project impacts to habitat can be offset through implementation of MM VEG 6 (below), which requires compensation for impacts to Blue Palo Verde–Ironwood Woodland at a ratio of 3:1.

Habitat fragmentation. Wildlife, including birds and bats, are often restricted to specific habitat types or elevations. Their habitats may be contiguous over extensive areas, or they may be scattered in patches in a landscape. For species with patchy distributions, dispersal between habitat patches may be important in colonizing (or recolonizing) areas or in supplementing demography or genetic makeup in isolated populations. Increasingly, land use planners designate wildlife dispersal corridors among open space areas to maintain movement routes for wildlife populations among the larger habitat areas. Public discussion of movement corridors tends to focus on uncommon, large, wide-ranging mammals, particularly mountain lions. But wildlife corridors also are intended to enable dispersal for other species, including small mammals, birds, amphibians, reptiles, and plants.

Beier and Lowe (1992) proposed a method for evaluating potential corridors, characterizing species as “corridor passage” and “corridor dwellers” depending on whether they would likely traverse the corridor during a single event (e.g., a mountain lion crossing from one mountain range to the other) or over a generation or longer (e.g., a population of pocket mice living within the corridor, with individual mice moving relatively short distances over time, but eventually colonizing new areas). Dispersal mechanisms relevant to birds and habitat fragmentation in the upper Chuckwalla Valley can be divided into three categories, partly analogous to Beier and Lowe’s “corridor passage” and “corridor dweller” categories.

1. Species dispersing short-distances, over the course of days, weeks, or longer. This category could include non-migratory birds whose behavior or anatomy limits their flight patterns to relatively short distances. They would move on the ground or via short flights, among shrubs in contiguous or nearly-contiguous habitat areas. While almost all birds are capable of flying long distances at times (e.g., during juvenile dispersal), behavior patterns of many species prevent them from moving across unsuitable habitat blocks. This effect is especially well-known among non-migratory shrubland species of coastal southern California (Soule et al. 1988). The project would not present an absolute barrier to movement, but it could reduce movement throughout the area for resident shrubland species, possibly including loggerhead shrike, Crissal thrasher, Le Conte’s thrasher, or Gila woodpecker. Any of these species would be likely to disperse around, but not across, the project site. However, dispersal probably would take place over a period of time rather than during a single event. These species are comparable to Beier and Loe’s “corridor dweller” category.
2. Species dispersing by longer-distance mechanisms. This category could include migratory birds or wide-ranging non-migrants routinely flying long distances within or among habitat patches. Examples include most raptors, common raven, and migratory passerines such as Lucy’s warbler and Bendire’s thrasher. The project’s effects on habitat fragmentation would be relatively unimportant for these species.

Equivalency analysis. The applicant, enXco, is working with Wildlands, Inc., a private firm specializing in habit preservation and management, to identify and acquire suitable compensation lands to mitigate the project’s potential impacts to regional wildlife movement. The equivalency analysis will be incorporated into the project’s Habitat Compensation Plan and the final Bird and Bat Conservation

implementation of Mitigation Measure MM WIL-5 (Golden Eagle Pre-construction and Construction Phase Surveys) requires annual monitoring during nesting season, and requires the project Owner to prepare and implement an adaptive management plan if golden eagles are found nesting in the area at any time during project construction.

5.6 HABITAT LOSS AND FRAGMENTATION

The term habitat refers to the environment and ecological conditions where a species is found. Wildlife habitat is generally described in terms of vegetation, though a more thorough explanation often must encompass further detail, such as availability or proximity to water; suitable nesting or denning sites; shade; foraging perches; cover sites to escape from predators; soils that are suitable for burrowing or hiding; limited noise and disturbance; and many other factors that are unique to each species. Vegetation reflects many aspects of habitat, including regional climate, physical structure, and biological productivity and food resources (for many wildlife species). Thus, vegetation is a useful overarching descriptor for habitat and it is the primary factor in this analysis of impacts to wildlife habitat. Habitat loss and fragmentation resulting from the project would be offset through habitat compensation, as required by Applicant Measure AM-1 and mitigation Measure VEG-6 (below).

Habitat loss. Project construction would result in permanent and long-term impacts to approximately 1,206 acres of natural vegetation, including 1,026 acres of Creosote Bush Scrub and 180 acres of Blue Palo Verde–Ironwood Woodland. Following construction, remaining vegetation and habitat would be unsuitable for many species, particularly species with specific habitat requirements, including most special-status wildlife species. Vegetation and habitat conditions following construction would likely remain suitable for relatively common species, such as side-blotched lizard (*Uta stansburiana*), house finch (*Carpacus erythrinus*), northern mockingbird (*Mimus polyglottos*), and desert cottontail (*Sylvilagus audubonii*).

Golden eagle. Golden eagles would be likely to forage on the DHSP site at any time of year, particularly during winter and migration seasons due to larger numbers of golden eagles in the region and their larger winter foraging ranges. Project construction would eliminate 1,208 acres of suitable foraging habitat from within the likely foraging ranges of 3 known territories. During years when golden eagles nest in the territories surrounding the site, the project could affect the availability of foraging habitat for the nesting pairs. This habitat loss may also affect golden eagle foraging during winter and migratory seasons, or may affect foraging by unmated golden eagles during the nesting season.

A substantial loss of foraging habitat within range of a nest site could cause reduced productivity or interfere with normal feeding behavior, though enXco does not anticipate the loss of foraging habitat on the project site and gen-tie line alignment would appreciably reduce foraging habitat availability for golden eagles using territories in the surrounding mountains. The nearest golden eagle nesting territory is in the Coxcomb Mountains, about 4 miles from the DHSP site. A circle with a radius of 4 miles comprises about a 50 square mile area; the DHSP site would affect about 4 percent of that area. Further, golden eagles forage at distances much greater than 4 miles from their nests. enXco does not believe that foraging habitat loss would constitute disturbance to golden eagles (pursuant to USFWS 2007), and would not cause decrease in productivity, or substantially interfere with normal breeding, feeding, or sheltering behavior. Moreover, Mitigation Measure MM VEG-6, would require compensatory land acquisition to offset project-specific loss of foraging habitat.

Gila Woodpecker. Gila woodpecker (*Melanerpes uropygialis*) was observed within the project area during December 2010, but was not observed during the subsequent winter or spring point counts. Blue

5.5 NEST AND ROOST SITE DISTURBANCES

The entire project site and surrounding area provides suitable nesting habitat for resident and migratory bird species. Many adult birds would flee from equipment during initial vegetation clearance for project construction. However, nestlings and eggs would be vulnerable to impacts during project construction. If initial site grading or brush removal were to occur during nesting season, then it likely would destroy bird nests, including eggs or nestling birds. One special-status species, the burrowing owl, is unlikely to flee the site during construction, due to its characteristic behavior of taking cover in burrows. Potential project impacts and an avoidance and mitigation measure for burrowing owl are summarized below.

Some birds will likely nest in the project area during construction and O&M phases, even after initial grading and clearing. Depending on the species, birds may nest on the ground close to equipment; within the open metal framework of the panel support structures; on buildings, foundations, structures, or construction trailers; or on idle vehicles or construction equipment left overnight or during a long weekend. In areas where construction is phased (e.g., footings, or tower structures) birds may quickly use these features as nest sites. The species most likely to nest in the project area during construction are common ravens (*Corvus corax*), house finches (*Carpacus erythrinus*), and mourning doves (*Zenaidura macroura*), all of which are protected by the MBTA and Fish and Game Code Sections 3503 and 3513.

Mitigation Measure MM WIL-3 (Pre-Construction Nest Surveys and Impact Avoidance Measures for Migratory Birds) describes pre-construction surveys, buffer areas, and other requirements to avoid bird mortality. Due to the high probability that birds may nest on site during construction, MM WIL-3 requires regular monitoring of the work area throughout the breeding season. In some cases, it may be necessary to reduce buffer areas or to remove or relocate a bird nest in coordination with the resource agencies to proceed safely with construction.

Burrowing Owl. Burrowing owls have been observed on site during winter and migratory seasons, but not during breeding season (Section 3.4). However, the habitat on the project site is suitable, and burrowing owls could occupy the site in low numbers in future breeding seasons. Potential direct project impacts to burrowing owls would be similar to those described for nesting birds, but construction activities also could destroy occupied burrows or cause the owls to abandon burrows during any season. If owls were present, construction during the breeding season could cause nest abandonment, or the incidental loss of fertile eggs or nestlings. Mitigation Measure MM WIL-4 (Burrowing Owl Impact Avoidance, Minimization, and Compensation Measures) would prevent take of occupied burrowing owl burrows.

Golden Eagle. The project site does not provide suitable golden eagle nesting habitat. However, the entire DHSP project area provides suitable foraging habitat, and is within several miles of golden eagle nesting territories located in the Eagle Mountains, Coxcomb Mountains, and Chuckwalla Mountains. Most of these territories were inactive in 2010 (activity, but not reproduction, was recorded at one nest site in the Coxcomb Mountains), but there have been no subsequent surveys for nesting activity. Human intrusions near golden eagle nest sites have resulted in nest abandonment; high nestling mortality when young go unattended due to altered behavior by the parent birds; premature fledging; and ejection of eggs or young from the nest (reviewed by Pagel 2010). Project activities that result in nest-site abandonment would constitute take under the Bald and Golden Eagle Protection Act (USFWS 2007).

Project construction is not expected to cause substantial direct disturbance (e.g., noise, lighting, visual disturbance) to nest sites in the local nesting territories, due to their distance from the site. Moreover,

enXco will construct all transmission lines and distribution lines according to APLIC guidelines (Mitigation Measure WIL-1) to minimize the risk of avian and bat collision, and to monitor bird fatality at the DHSP site to evaluate need for follow-up adaptive management measures (see Monitoring and Adaptive Management sections, below).

5.3 ELECTROCUTION POTENTIAL

The gen-tie line and above-ground collection and distribution lines may present electrocution risk to certain large birds. Large raptors including golden eagles, Swainson's hawks, ferruginous hawks, red-tailed hawks, prairie falcons, and other large aerial perching birds such as turkey vultures, are susceptible to electrocution on power lines because of their large size and proclivity to perch on tall structures. Transmission structure design is a major factor in causing or preventing raptor electrocutions. Electrocution occurs when a perching bird simultaneously contacts two energized phase conductors or an energized conductor and grounded hardware. This happens most frequently when a bird attempts to perch on a transmission structure with insufficient clearance between the conductor phases or conductors and grounds. The majority of raptor electrocutions are caused by distribution lines and relatively small transmission lines, energized at voltage levels between 1 kV and 69 kV. Higher voltage transmission lines are built with wider spacing between the conductors and grounds, and present reduced threat of electrocution. Electrocution can occur when horizontal separation is less than the wrist-to-wrist (flesh-to-flesh) distance of a bird's wingspan or where vertical separation is less than a bird's length from head-to-foot. Electrocution can also occur when birds perched side-by-side span the distance between these elements (APLIC 2006).

The largest bird that is likely to come in contact with the gen-tie line is golden eagle (wingspan to 7.5 feet; wrist-to-wrist length of 3.5 feet; height to 2.2 feet). The red-tailed hawk is the most common large bird that could come in contact with the gen-tie lines (wingspan to 4.7 feet; wrist-to-wrist length of 1.9 feet; height to 1.8 feet). Other large birds in the area are turkey vulture (5.8-foot wingspan, two-foot wrist-to-wrist length, 1.8 feet tall) and great horned owl (4.3-foot wingspan, 2.1-foot wrist-to-wrist length, 1.3 feet tall). Swainson's hawk has a 4.5 foot wing-span, and can be 1.3 feet tall (bird sizes from APLIC 2006). The Avian Powerline Interaction Committee (APLIC, 2006) guidelines recommend 60 inch separations between components to protect eagles and other birds from electrocution. The risk of electrocution would be minimized by implementation of Mitigation Measure MM WIL 1, which requires that the project Owner implement APLIC Guidelines for the gen-tie and all electrical components.

5.4 TERRITORY ABANDONMENT

Construction activities would cause most mobile vertebrate wildlife to leave the site, or attempt to leave. Animals dispersing from the site would be subject to further adverse effects, potentially including mortality. They would be at increased risk of predation as they flush from cover during site clearing. After leaving their home territories, displaced animals may be unable to find suitable food or cover in new, unfamiliar areas. They may attempt to return to their home ranges, possibly resulting in increased predation risk or other effects. Or, if they find food and other resources at new locations off site, these may be within the occupied territory of another individual of the same or similar species, resulting in competition for resources. These displacement effects would apply to common wildlife species and to special-status species.

should address the potential for take, including lethal take, based on each of the threats described below (Sections 5.1 through 5.7).

5.1 BURNING FROM CONCENTRATED LIGHT AT SOLAR ARRAYS

As a PV solar facility, the DHSP would not concentrate light for electricity generation and would not pose a burning risk to birds or bats.

5.2 TRANSMISSION LINE, DISTRIBUTION LINE, POWER TOWER, METEOROLOGICAL TOWER, OR GUY LINE COLLISION

The project component of greatest potential concern that would pose lethal collision risk to birds or bats is the gen-tie line, during the construction, O&M, and decommissioning project phases. Smaller risks would be posed by other components, during any of the three phases. These include the above-ground distribution lines, above-ground collection lines, the meteorological station(s) and any guy-wires that may support meteorological instruments, and large equipment such as cranes that would be in use during the construction and decommissioning phases. As a PV solar facility, the project would not include a power tower.

Bird collisions with power lines generally occur when: (1) a power line or other aerial structure transects a daily flight path used by a concentration of birds, or (2) migrant birds are traveling at reduced altitudes and encounter tall structures in their path. Collision rates generally increase in low light conditions, during rain, snow, or strong winds, and during panic flushes when birds are startled by a disturbance or are fleeing from danger. Collisions are more probable near wetlands, valleys that are bisected by power lines, and within narrow passes where power lines run perpendicular to flight paths. Passerines (e.g., songbirds) and waterfowl (e.g., ducks) collide with wires (APLIC 2006), particularly during nocturnal migrations or poor weather conditions (Avery 1979). However, passerines and waterfowl have a lower potential for collisions than larger birds, such as raptors. Passerines and waterfowl tend to fly under power lines. Larger species generally fly above the power lines (generally heavy gauge conductors that are readily visible), but they may risk colliding with the lighter and less visible static or ground lines mounted higher on the same tower structures. Also, many smaller birds tend to reduce their flight activity during poor weather conditions (Avery et al. 1978). The magnitude of collision-caused bird mortality cannot be predicted without extensive information on bird species, abundance, and movements in the area.

The PV solar panels themselves may also pose a collision risk. Large-scale solar facilities present a relatively new and unresearched risk for bird collisions. Studies conducted at the Solar I facility, a central receiver solar power plant near Daggett, California, indicated that bird mortality consisted predominantly of collisions with mirrors (McCrary et al. 1986). To date, little is known regarding the avian response to reflection or glare from PV solar technology. The reflectivity of PV solar technology is lower than that of the mirrors (heliostats) used by thermal solar projects like the Solar I facility, however, it is possible that glare could affect birds to some degree if the panels reflected light and images, as they might be mistaken for open sky or water. Light reflecting from the panels could cause an increase in glare and Polarized Light Pollution (PLP). According to Horvath et al. (2010), PLP caused by anthropogenic structures can alter the ability of wildlife to seek out suitable habitat, detect or elude predators, or effectively navigate using natural polarized light patterns, ultimately affecting dispersal and reproduction.

4.6 OTHER SPECIAL STATUS BIRD AND BAT SPECIES

Raptors. In addition to raptors discussed above, several other special-status birds of prey are found seasonally, especially during winter, in the region. These include osprey (*Pandion haliaetus*), ferruginous hawk (*Buteo regalis*), Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*A. striatus*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), merlin (*F. columbaris*), short-eared owl (*Asio flammeus*), and long-eared owl (*A. otus*) (Table 4). Osprey and sharp-shinned hawk were observed flying over the site during winter season point count surveys, but neither species would nest in the area (AMEC 2011). Outside their breeding seasons, these raptors need not return to their nests to feed young or tend eggs. Thus, they are able to forage over wide areas, where they capture birds or small mammals. Suitable winter or migratory season foraging habitat for all of these raptors is widely available throughout the region.

DHSP occurrence: Potential project impacts to these species and their foraging habitat would be comparable to those discussed above for wintering golden eagles. In summary, project construction would eliminate 1,208 acres of suitable foraging habitat, cause increased noise and disturbance to adjacent habitat, and may present collision or electrocution hazards, such as the gen-tie line and other project facilities.

Upland perching birds. Several upland perching bird species are included in the CDFG Special Animals compilation. These include loggerhead shrike (*Lanius ludovicianus*), LeConte's thrasher (*T. lecontei*), Crissal thrasher (*T. crissale*), the Eagle Mountains scrub-jay population (*Aphelocoma californica cana*), and vermilion flycatcher (*Pyrocephalus rubinus*). In addition, a Vaux's swift (*Chaetura vauxi*) was observed over the site during migration season (AMEC 2011); this species occurs in the area only during migration; it nests well to the north, and project development would be unlikely to affect Vaux's swift.

DHSP occurrence: Loggerhead shrikes were observed on the site routinely throughout the winter and breeding season avian point count surveys (AMEC 2011). Neither LeConte's thrasher nor Crissal thrasher have been reported on-site, but habitat is suitable and either species could occur there. Project development would eliminate 1,208 acres of suitable habitat for these species at the solar generator site, and would also affect smaller areas of suitable habitat along gen-tie alignments. Vermilion flycatchers have not been reported on-site, but nest in similar habitat to the south (AMEC 2011) and could nest in ironwood woodlands on-site in future years. Project development would eliminate 180 acres of suitable desert woodland habitat at the solar generator site, and would also affect smaller areas of suitable habitat along gen-tie alignments. The Eagle Mountains scrub-jay population resides year-around in pinyon woodlands in the Eagle Mountains. It is disjunct from other scrub-jay populations, and is on CDFG's "watch list" but has no other special conservation status. A scrub-jay was observed on the project site in October 2011; presumably, it was wandering or dispersing from habitat in the Eagle Mountains. However, this bird could have come from much farther away. Scrub-jays of the Great Basin population can wander considerable distances. However, no suitable scrub-jay habitat is found in the project area. Other potential impacts to these species would be similar to those discussed below, under the MBTA.

5.0 RISK ASSESSMENT

This section of the BBCS describes project-specific risks that the DHSP would or could pose to birds and bats. The USFWS (2010b) recommends that the project-specific risk assessments for solar projects

Lucy's warbler (*Vermivora luciae*). Lucy's warbler is a migratory songbird that breeds in desert riparian woodlands and winters on Pacific Coast of mainland Mexico. Its breeding range extends through much of Arizona, and parts of the eastern California deserts. It is a cavity-nesting species (i.e., it generally nests in unoccupied woodpecker nests or other cavities in trees). Its primary nesting habitat is mesquite thickets, but also uses native riparian trees and saltcedar (*Tamarix* spp.).

DHSP occurrence: Two singing male Lucy's warblers were reported in April 2011 near the southwestern corner of the project area (AMEC 2011). These birds were not observed later during the nesting season (28 April survey date), though no focused surveys were conducted. It is unknown whether either or both of these birds successfully established breeding territories in the area, or moved on to another site. Suitable nesting cavities may be available in large blue palo verde trees on the site, but probably not in the more dominant desert ironwood trees (see Gila woodpecker discussion, above). Lucy's warblers may nest in desert wash woodlands on or near the proposed solar facility site or gen-tie alignment alternatives.

Project development would eliminate up to 180 acres of potential nesting and foraging habitat for Lucy's warbler on the proposed solar generator site, and could also affect smaller areas of suitable habitat along gen-tie alignments. In addition to habitat impacts, the project could cause mortality or injury to a Lucy's warbler (including juvenile birds or eggs), if an active nest were damaged or disturbed during construction or other phases of the project. Potential project impacts would be comparable to those described for nesting birds, below.

Bats. The BLM includes several bat species on its list of sensitive species. The special status bats of the local area roost in rock crevices, tunnels, or caves; one species (western yellow bat) roosts in the foliage of riparian trees. Roost sites may be used seasonally (e.g., inactive cool seasons) or daily (day roosts, used during inactive daylight hours). Maternity roosts are particularly important overall for bat life histories. Knowledge of bat distributions and occurrences is sparse. The majority of adverse impacts to bat populations in the region result from disturbance of roosting or hibernation sites, especially where large numbers of bats congregate; physical closures of old mine shafts, which eliminates roosting habitat; elimination of riparian or desert wash microphyll vegetation which is often productive foraging habitat; more general habitat loss or land use conversion; and agricultural pesticide use which may poison bats or eliminate their prey-base (Pierson & Rainey 1998; Gannon 2003). Bat life histories vary widely. Some species hibernate during winter, or migrate south. During the breeding season, bats generally roost during the day, either alone or in communal roost sites, depending on species. All special status regional bats are insectivorous, catching their prey either on the wing or on the ground. Some species feed mainly over open water where insect production is especially high, but others forage over open shrublands such as found on the project site.

DHSP occurrence: Project development is unlikely to affect roost sites for most special status bats, though pallid bats could roost among small rocks on the ground and California leaf-nosed bats might roost in ironwood trees between foraging bouts (Ironwood Consulting 2010). The project would eliminate 1208 acres of desert shrubland foraging habitat, including 180 acres of productive Blue Palo Verde – Ironwood Woodland foraging habitat, and would also affect smaller areas of foraging habitat along gen-tie alignments. Desert dry wash woodland attracts foraging bats due to increased insect productivity. This is especially true for California leaf-nosed bats and pallid bats that feed on large insects they glean from the foliage. Roosts for these species have been identified in mines in the Eagle and Coxcomb Mountains, north of the DHSP site (Ironwood Consulting 2010).

In addition to species addressed in this section of the BBCP, all listed threatened or endangered species (above) are managed as BLM sensitive species.

Burrowing owl (*Athene cunicularia*). The burrowing owl is a BLM Sensitive Species and a CDFG Species of Special Concern. It is a small, terrestrial owl of open country. During breeding season, it ranges throughout most of the western US. It occurs year-around in southern California, but may be more numerous during fall and winter, when migratory individuals from farther north join the regional resident population. Burrowing owls favor flat, open annual or perennial grassland or gentle slopes and sparse shrub or tree cover. They use the burrows of ground squirrels and other rodents for shelter and nesting. Availability of suitable burrows is an important habitat component. Where ground squirrel burrows are not available, the owls may use alternate burrow sites or man-made features (such as drain pipes or debris piles). In the California deserts, burrowing owls generally occur in low numbers in scattered populations, but they can be found in much higher densities near agricultural lands where rodent and insect prey tend to be more abundant (Wilkerson and Siegel 2011). Burrowing owl nesting season, as recognized by the California Burrowing Owl Consortium (CBOC 1993), is 1 February through 31 August.

DHSP occurrence: During the desert tortoise surveys for the Desert Harvest project site (above), AMEC field biologists examined all suitable burrows for sign of burrowing owls. These field surveys correspond to 100 percent coverage Phase 2 surveys for burrowing owls, recommended by the CBOC protocol (1993). No burrowing owls or their sign were observed during these spring season surveys, or during the winter and breeding season avian point count surveys. However, two incidental burrowing owl observations were made by Aspen biologists during streambed delineation field work. In one observation, a burrowing owl was briefly seen perching and flying, but was not at a burrow. The other observation was a burrowing owl seen in the mouth of an inactive desert kit fox burrow; no burrowing owl sign (e.g., whitewash, prey remains, or owl pellets) was found at the site. Based on these field surveys and incidental observations, we conclude that the site is suitable habitat for burrowing owls during winter or breeding seasons. Breeding burrowing owls were not present on the site during the desert tortoise surveys, but they could nest on the site in future years. During fall and winter, the site appears to serve as low-density seasonal burrowing owl habitat.

Bendire's thrasher (*Toxostoma bendirei*). Bendire's thrasher is a BLM Sensitive Species and CDFG Species of Special Concern. California populations are migratory, though Bendire's thrasher is found year-around in more southern portions of its range, in southern Arizona and adjacent Mexico. The Desert Harvest site is near the southern boundary of its breeding range in California. It breeds in open, upland desert shrublands of JTNP and surrounding area, and northward through several disjunct regions of the Mojave Desert (Sterling 2008). Its habitat requirements are poorly understood, but it is generally associated with *Yucca* (e.g., Joshua tree) and *Opuntia* (cholla cacti) species on gently sloping terrain. Soil texture is apparently important to habitat suitability, perhaps because Bendire's thrashers largely forage on ground-dwelling insects. Hard rocky soils (e.g., desert pavement) and loose sands (e.g., dry wash sands) are apparently less suitable than firmly packed, fine-textured soils.

DHSP occurrence: Bendire's thrashers were not observed on the project site during the winter or breeding-season point-count surveys. Habitat throughout the site appears to be of marginal suitability, due to relatively low cover of *Yucca* and *Opuntia* species, and seemingly poorly-suitable soil texture. There is a low to moderate probability that Bendire's thrasher may occur on the site. Project development would eliminate 1,208 acres of marginally suitable habitat at the solar generator site, and would also affect smaller areas of suitable habitat along gen-tie alignments.

Absent interference from humans, the densities of breeding golden eagle territories is limited by either prey density or nest site availability (USFWS 2009). Breeding season home range sizes vary widely. For example, in San Diego County, a study of 27 nesting pairs found breeding ranges to average 36 square miles with a range from 19 to 59 square miles (Johnsgard 1990). Eagles and other raptors forage more widely outside of the nesting season, since they have no need to return daily to eggs or young at their nests.

DHSP occurrence: The mountain ranges surrounding the project site provide suitable golden eagle nesting habitat. There were 8 inactive golden eagle nests documented to the northwest, northeast, and south of the Desert Harvest site, and one active but non-reproductive nest was reported in the Coxcomb Mountains, about 4 miles northeast of the site (BLM 2011a). Even if golden eagle territories may be inactive in a given year, they may be used in future years. Therefore, unoccupied territories are considered potentially active in future years. The proposed solar generator site and gen-tie line alignments are on the Chuckwalla Valley floor, and do not provide suitable golden eagle nesting habitat. No on-site impacts to nest sites are expected, but golden eagles are sensitive to human disturbances during the nesting season. If there is an active nest nearby, then human activity and noise during project construction could adversely affect golden eagle nesting success.

The project site and gen-tie alignments provide suitable golden eagle foraging habitat. Golden eagles could forage at the Desert Harvest site at any time of year. Foraging birds could include mated pairs using the surrounding nesting territories; or, if the territories are inactive, unmated golden eagles or adult birds whose nests may have failed, could forage over the site during breeding season. Foraging would be somewhat more common during winter and migration seasons due to larger numbers of golden eagles in the region and their larger winter foraging ranges.

4.4 SPECIES FULLY PROTECTED UNDER THE CALIFORNIA FISH AND GAME CODE

Most of the state's designated fully protected species occur well outside the project vicinity, but two fully protected birds could occur in the area. These are: golden eagle (discussed above, Species Protected Under the Bald and Golden Eagle Protection Act) and American peregrine falcon.

American peregrine falcon (*Falco peregrinus*). Peregrine falcons were formerly listed under CESA and ESA, but have been delisted under both Acts. They are found irregularly in the low desert region, generally during migratory and winter seasons. They have not been known to nest in the region in recent decades, though they did nest in desert mountain ranges near the Colorado River historically (Rosenberg et al. 1991; Patten et al. 2003). They feed primarily on birds captured during flight. Waterfowl and shorebirds make up a large proportion of their prey, and nest sites are often within foraging range of large water bodies.

DHSP occurrence: There is only minimal likelihood that American peregrine falcon would be found in the project vicinity, except as brief overflight during migration. Project implementation would not affect nesting habitat and has little likelihood of adversely affecting foraging behavior.

4.5 BLM SENSITIVE SPECIES

The BLM maintains a list of Sensitive Species, including species that are rare, declining, or dependent on specialized habitats (BLM 2010). It manages sensitive species to provide protections comparable to species that may become listed as threatened or endangered (i.e., candidate species for federal listing).

DHSP occurrence: A Gila woodpecker was observed in the southeastern part of the project site in December 2010 (AMEC 2011), but was not seen again during the BLM protocol winter season or breeding season avian point counts. The Desert Harvest project site is about 40 miles west of the Gila woodpecker's published geographic range (McCreedy 2008), but unpublished observations have been reported from Corn Springs, about 11 miles south of the site and about five miles south of the southern end of the gen-tie alignments (C. McGaugh, AMEC, pers. obs.). There is a native palm grove at Corn Springs, and Gila woodpeckers may nest in the palm trees. Also, a Gila Woodpecker was reported on 28 September 2010 at the Desert Sunlight Project site (AMEC 2011). It is possible that the Corn Springs and Desert Center areas support a small Gila woodpecker population, or that the two local observations in late 2010 were chance observations of an itinerant individual.

Desert wash woodlands on the Desert Harvest site may provide suitable nesting and foraging habitat for Gila woodpecker. The woodlands are dominated by desert ironwood trees, and most of the blue palo verdes are too small for cavity nests. However, scattered larger blue palo verde trees are present in low numbers throughout the woodlands, and could serve as suitable nest trees.

Swainson's hawk (*Buteo swainsoni*). The Swainson's hawk is listed as a threatened species under CESA but has no federal listing status. It is a migratory raptor. It breeds in open plains and prairies in the Great Plains and relatively arid areas of western North America, including the Central Valley and the western Mojave Desert in California. It winters in South America, primarily in Argentina. During the spring and fall migration seasons, Swainson's hawks are observed regularly in southern California.

DHSP occurrence: One Swainson's hawk was observed flying over the Desert Harvest project site during April 2011 (AMEC 2011). The project area may serve as incidental foraging habitat during migratory seasons, but otherwise would not support Swainson's hawks, due to the distance from its breeding range. Project development would not affect nesting habitat and has little likelihood of adversely affecting Swainson's hawk.

4.3 SPECIES PROTECTED UNDER THE FEDERAL BALD AND GOLDEN EAGLE PROTECTION ACT

Golden Eagle (*Aquila chrysaetos*). Golden eagles are year-around residents throughout most of their range in the western United States. In the southwest, they are more common during winter when eagles that nest in Canada migrate south into the region. They breed from late January through August, mainly during late winter and early spring in the California deserts (Pagel et al. 2010). In the desert, they generally nest in steep, rugged terrain, often on sites with overhanging ledges, cliffs or large trees as cover. Golden eagles are wide-ranging predators, especially outside of the nesting season, when they have no need to return daily to eggs or young at their nests. Golden eagle foraging habitat consists of open terrain such as grasslands, deserts, savanna, and early successional forest and shrubland habitats, throughout the regional foothills, mountains, and deserts. They prey primarily on rabbits and rodents but will also take other mammals, birds, reptiles, and some carrion (Kochert et al. 2002).

Threats to golden eagles include illegal shooting, power line electrocution, wind turbine strikes, and rodenticides (used for rodent control, and secondarily ingested by eagles feeding on target pest species). They also are affected by habitat loss or degradation due to land use changes such as urbanization and agriculture. The golden eagle population is estimated at approximately 27,000 in the western U.S., and an apparent ongoing decline in numbers (Farmer 2008; USFWS 2009).

THR: Federally listed, threatened.

Candidate: Sufficient data are available to support federal listing, but not yet listed.

Proposed: Formally proposed for federal status shown.

State designations: (California Endangered Species Act, California Dept. of Fish and Game)

END: State listed, endangered.

THR: State listed, threatened.

RARE: State listed as rare (applied only to certain plants).

SSC: California species of special concern. Considered vulnerable to extinction due to declining numbers, limited geographic ranges, or ongoing threats.

FP: Fully protected. May not be taken or possessed without permit from CDFG.

CDF&G Natural Diversity Data Base Designations: Applied to special status plants and sensitive plant communities; where correct category is uncertain, CDF&G uses two categories or question marks.

S1: Fewer than 6 occurrences or fewer than 1000 individuals or less than 2000 acres.

S1.1: Very threatened

S1.2: Threatened

S1.3: No current threats known

S2: 6-20 occurrences or 1000-3000 individuals or 2000-10,000 acres (decimal suffixes same as above).

S3: 21-100 occurrences or 3000-10,000 individuals or 10,000-50,000 acres (decimal suffixes same as above).

S4: Apparently secure in California; this rank is clearly lower than S3 but factors exist to cause some concern, i.e., there is some threat or somewhat narrow habitat. No threat rank.

S5: Demonstrably secure or ineradicable in California. No threat rank.

SH: All California occurrences historical (i.e., no records in > 20 years).

SX: Presumed extirpated in California.

Definitions of occurrence probability: Estimated occurrence probabilities based literature sources cited earlier and field surveys and habitat analyses reported here.

Occurs: Observed on the site by qualified biologists.

Expected: Not observed or recorded on the site, but very likely present during at least a portion of the year.

High: Habitat is a type often utilized by the species and the site is within the known range of the species.

Moderate: Site is within the known range of the species and habitat on the site is a type occasionally used.

Low: Site is within the species' known range but habitat is rarely used, or the species was not found during focused surveys covering less than 100% of potential habitat or completed in marginal seasons.

Minimal: No suitable habitat on the site; or well outside the species' known elevational or geographic ranges; or a focused study covering 100% of all suitable habitat, completed during the appropriate season and during a year of appropriate rainfall, did not detect the species.

Unknown: No focused surveys have been performed in the region, and the species' distribution and habitat are poorly known.

4.2 LISTED THREATENED OR ENDANGERED SPECIES

Gila woodpecker (*Melanerpes uropygialis*). The Gila woodpecker is listed as endangered under CESA but has no status under the federal ESA. It is identified as bird species of conservation concern (USFWS 2008). Its geographic range is generally in southern Arizona and southward into Baja California and western mainland Mexico. It occupies this range year-around (i.e., it is not migratory). In California, Gila woodpeckers are known from riparian forests along the Colorado River, and from desert wash woodlands in Imperial County (McCreedy 2008). It excavates cavity nests in large riparian trees such as cottonwoods and (in upland habitats) saguaro cacti, and feeds largely on insects, mistletoe berries, and cactus fruits (Rosenberg et al. 1991; McCreedy 2008). Its primary habitat is cottonwood-willow riparian woodland, but it also uses thickets of other desert trees (e.g., desert ironwood), as well as upland habitats, especially outside the breeding season. Desert ironwood is apparently too dense for nest excavation. Where Gila woodpeckers occur in dry desert wash woodlands, they excavate cavity nests "invariably" in large blue palo verdes rather than ironwood (McCreedy 2008). In suburban habitats, they nest in ornamental trees including athel (*Tamarix aphylla*), eucalyptus, and palms. Availability of suitable nesting trees is apparently a limiting factor in breeding habitat suitability (Grinnell and Miller 1944).

Special Status Bird and Bat Species	Habitat and Distribution	Activity season	Conservation Status	Occurrence Probability
<i>Vermivora luciae</i> Lucy's warbler	Cavity-nesting species; breeds in desert riparian woodlands through much of Arizona; winters on Pacific Coast of mainl. Mexico	spring - summer	Fed: none BLM: Sensitive Calif: SSC S2S3 (nesting)	Nesting: Low-moderate (margin of known range; few nest cavities avail.); singing males observed April 2011
MAMMALS				
<i>Antrozous pallidus</i> Pallid bat	Rock outcrops of shrublands, mostly below about 6000 ft. elev.; Calif, SW N Amer through interior Oregon and Washington; hibernates in winter	Warm season	Fed: none BLM: Sensitive Calif: SSC S3	Low potential for roosting on site; high potential for foraging in area
<i>Corynorhinus (Plecotus) townsendii</i> Townsend's big-eared bat (incl. "pale," "western," and other subspecies)	Many habitats throughout Calif and W N Amer, scattered pop'ns in E; day roosts in caves, tunnels, mines; feed primarily on moths	Year-around	Fed: none BLM: Sensitive Calif: SSC, S2S3	Low potential for roosting on site; high potential for foraging in area
<i>Euderma maculatum</i> Spotted bat	Desert (cool seasons) to pine forest (summer), much of SW N Amer. but very rare; roosts in deep crevices in cliffs, feeds on moths captured over open water	Not known	Fed: none BLM: Sensitive Calif: SSC S2S3	Low potential for roosting or foraging on site
<i>Eumops perotis californicus</i> California mastiff bat	Lowlands (with rare exceptions); cent. and S Calif., S Ariz., NM, SW Tex., N Mexico; roost in deep rock crevices, forage over wide area	Year-around	Fed: none BLM: Sensitive Calif: SSC S3?	Low potential for roosting on site; high potential for foraging in area
<i>Lasiurus xanthinus (Nycteris ega xanthina)</i> Western (Southern) yellow bat	Mexico and Cent. Amer., to S AZ; Riv., Imperial and San Diego Cos.; riparian and wash habitats; roosts in trees; evidently migrates from Calif. during winter	Spring-summer?	Fed: none Calif: S3	Low potential for roosting on site; high potential for foraging in area
<i>Macrotus californicus (M. waterhousii)</i> California leaf-nosed bat	Arid lowlands, S Calif., S and W Ariz., Baja Calif. and Sonora, Mexico; roost in mine-shafts, forage over open shrublands	Year-around	Fed: none BLM: Sensitive Calif: SSC S2S3	Low potential for roosting on site; high potential for foraging in area
<i>Nyctinomops macrotis (Tadarida molossa)</i> Big free-tailed bat	Roosts in crevices of rocky cliffs, scattered localities in W N. Amer. through Cent. Amer.; ranges widely from roost sites; often forages over water	Year-around (?)	Fed: none Calif: SSC S2	Low potential for roosting on site; high potential for foraging in area
<i>Nyctinomops femorosaccus (Tadarida femorosaccus)</i> Pocketed free-tailed bat	Deserts and arid lowlands, SW US, Baja Calif., mainland Mexico; Roost mainly in crevices of high cliffs; forage over water and open shrubland	Year-around	Fed: none Calif: SSC S2S3	Low potential for roosting on site; high potential for foraging in area

General References: American Ornithologists Union 1998; Barbour and Davis 1969; CDFG 2011a; 2011b; Feldhammer et al. 2003; Garrett and Dunn 1981; Grinnell and Miller 1944; Hall 1981; Rosenberg, et al. 1991; Schuford and Gardali 2008.

Conservation Status

Federal designations: (federal Endangered Species Act, US Fish and Wildlife Service). Until 1996, FWS maintained a list of Category 2 candidates, described as species of concern, but with insufficient data to support listing. This list is no longer maintained and FWS has no SOC category.

END: Federally listed, endangered.

Special Status Bird and Bat Species	Habitat and Distribution	Activity season	Conservation Status	Occurrence Probability
<i>Falco peregrinus</i> American peregrine falcon	Nests on high cliffs, generally near water bodies; feed on birds (esp. shorebirds & waterfowl); widespread but rare worldwide	Spring - summer	Fed: none (former END) BLM: sensitive Calif: FP, S2 (former END)	Nesting: Minimal (no suitable nest sites; well outside breeding range) Foraging: Minimal (outside winter range, no suitable prey base)
<i>Asio flammeus</i> Short-eared owl	Breeds in marshes and densely vegetated wetlands, forages over open wetlands, ag fields, and grasslands; temperate N & S America, Eurasia	Year-around	Fed: none Calif: S3, SSC (nesting)	Breeding: Minimal (no habitat) Winter: reported near Lake Tamarisk
<i>Asio otus</i> Long-eared owl	Breed in riparian woodlands; forage (nocturnally) over open land; sea level to about 6000 ft. elev.; through N America and Eurasia	Year-around	Fed: none Calif: S3 SSC (nesting)	Breeding: Minimal (no habitat) Winter: Occurs at Lake Tamarisk
<i>Chaetura vauxi</i> Vaux's swift	Breeds central Calif. and northward, in coastal and montane forests; winters in Central and S America	Spring and fall migr. seasons	Fed: none Calif: SSC S3 (nesting)	Nesting: Minimal (outside range) Migration: Present, occasional flyover
<i>Melanerpes uropygialis</i> Gila woodpecker	Saguaro woodlands, sometimes other woodlands; cavity nester mainly in cactus; SE Calif., S Ariz, W Mexico (incl. Baja)	Year-around	Fed: none BLM: Sensitive Calif: END S1S2	Nesting: Minimal (ironwood poor for nest constr.) Winter: Present (Jan 2011); see text
<i>Lanius ludovicianus</i> Loggerhead shrike	Woodlands, shrublands, open areas with scattered perch sites; not dense forest; widespread in N America; valley floors to about 7000 ft. elev.	Year-around	Fed: none Calif: SSC S4 (nesting)	Present (suitable habitat throughout)
<i>Aphelocoma californica cana</i> Scrub jay (Eagle Mtn population)	Locally endemic year-around resident in pinyon woodlands in the Eagle Mountains; long-disjunct from other populations	Year-around	Fed: none Calif: CDFG watch list, S1S2	Present (observed as transient, Oct 2011)
<i>Toxostoma bendirei</i> Bendire's thrasher	Joshua tree woodland, desert scrub; high cactus cover; mainly E Mojave Des in Calif. (scarce in W Mojave); American SW and mainl. Mexico; winters in S Arizona, New Mexico, and mainl. Mexico	Spring-summer	Fed: none BLM: Sensitive Calif: SSC S3	Low-Moderate; marginal habitat throughout
<i>Toxostoma crissale</i> Crissal thrasher	Nests in dense, low, brushy thickets of mesquite or other desert riparian shrubs; Sonoran Des, E Mojave Des, to Texas, W mainland Mexico	Year-around	Fed: none Calif: SSC S3	Low-moderate; habitat marginally suitable
<i>Toxostoma lecontei</i> LeConte's thrasher	Calif. deserts, SW Central Val. & Owens Val., east to Utah, Arizona; open shrubland, often sandy or alkaline flats	Year-around	Fed: none Calif: S3 (SSC in San Joaquin Val)	High; suitable habitat throughout
<i>Pyrocephalus rubinus</i> Vermillion flycatcher	Desert riparian woodlands and shrublands; SE Calif., east through S Texas, and S through Mexico; winters in Mexico	spring-summer	Fed: none Calif: SSC S2S3 (nesting)	Nesting: Moderate (suitable nesting habitat in ironwood stands)

Table 2. Special Status Bird and Bat Species of the Chuckwalla Valley Area.

Special Status Bird and Bat Species	Habitat and Distribution	Activity season	Conservation Status	Occurrence Probability
BIRDS				
<i>Circus cyaneus</i> Northern harrier	Breeds colonially in grasslands and wetlands; forages over open terrain; N America and Eurasia	Winter; rare in summer	Fed: none Calif: SSC S3 (nesting)	Nesting: Minimal (no habitat) Foraging: Expected rarely, mainly winter
<i>Aquila chrysaetos</i> Golden eagle	Nests in remote trees and cliffs; forages over shrublands and grasslands; breeds throughout W N America, winters to E coast	Year-around	Fed: Eagle Protection act (see text) Calif: SSC S3 fully protected	Nesting: Minimal on-site (no suitable nest sites); occurs in surrounding mtns Foraging: High (year-around)
<i>Pandion haliaetus</i> Osprey	Nests in northern N America and Mexican coastlines near large water bodies, preys primarily on fish; winters in central Calif to S America;	Spring and fall migr. seasons	Fed: none Calif: S3, watch list (nesting)	Nesting: Minimal (outside range; no suitable sites) Migration: Present, occasional flyover
<i>Buteo swainsonii</i> Swainson's hawk	Breeds in trees in open habitats (e.g., grassland), Central Valley (Calif.) and east to cent. US, S. Canada, N. Mexico; winters in S America. A few nesting records in W Mojave Des (e.g., Lancaster area)	Spring and fall migr. seasons	Fed: none Calif: S2, THR	Nesting: Minimal (outside range; no suitable sites) Migration: Present, occasional flyover
<i>Buteo regalis</i> Ferruginous hawk	Forages over grassland and shrubland; winters in W and SW N Amer. (breeds in Great Basin and N plains)	Winter	Fed: none Calif: SSC S3S4 (wintering)	Nesting: Minimal (outside range) Winter: Expected during winter
<i>Accipiter striatus</i> Sharp-shinned hawk	Nests and hunts in forest & woodland mainly to N (may breed in S Calif. Mtn woodlands); also forages in open areas; regularly winters in S Calif.	Winter	Fed: none Calif: SSC S3 (nesting)	Nesting: Minimal (no habitat, outside range) Winter/Migration present (Jan 2011)
<i>Accipiter cooperii</i> Cooper's hawk	Nests and hunts in forest & woodland, also forages in open areas; most of US, Central and S America	Year-around	Fed: none Calif: SSC S3 (nesting)	Nesting: Minimal (no habitat) Winter/Migration expected
<i>Falco columbaris</i> Merlin	Uncommon in winter in S Calif. desert and valleys (breeds in northern N America and Eurasia)	Winter	Fed: none Calif: SSC S3 (wintering)	Nesting: Minimal (outside range) Winter: Expected during winter
<i>Falco mexicanus</i> Prairie falcon	Nests on high cliffs, forages primarily over open lands; occurs throughout arid western US and Mexico	Year-around	Fed: none Calif: SSC S3 (nesting)	Nesting: Minimal on-site, occurs in surrounding mtns Foraging: High (year-around)
<i>Athene cunicularia</i> (<i>Speotyto cunicularia</i>) Burrowing owl	Nests mainly in rodent burrows, usually in open grassland or shrubland; forages in open habitat; increasingly uncommon in S Calif.; occurs through W US and Mexico	Year-around	Fed: none Calif: SSC S2 (burrow sites)	Present (Sep 2011); see text

this habitat would be affected by solar generator construction, and only generator tie-line Alternative E would affect it. Impacts acreage would be dependent on the specific locations of access roads, transmission line structures, and work sites.

4.0 BIRD AND BAT SPECIES OF THE PROJECT VICINITY

4.1 INFORMATION COMPILED TO DATE (PRE-CONSTRUCTION SURVEYS)

The following discussion of bird and bat occurrence in the area is based on field surveys conducted by Aspen and AMEC field staff the Desert Harvest project, and a review of field surveys for previous projects in the vicinity (Aspen 2012). Aspen and AMEC biologists reviewed the California Natural Diversity Data Base (CNDDDB; California Dept. of Fish and Game, CDFG 2011a) to identify special status species known from the area. We also reviewed applicable documents pertaining to the Desert Sunlight project, including the vegetation and wildlife sections of the Environmental Impact Statement (BLM 2011a) and the Biological Resources Technical Report (Ironwood Consulting 2011). During all field surveys conducted for the Desert Harvest project, all incidental bird species observations were recorded in field notes.

AMEC biologists conducted avian point count surveys during winter and spring of 2011 to comply with BLM requirements (2009). Winter season point counts were conducted during January 2011, and breeding season point counts were between March 30 and April 28, 2011. A total of 45 bird species was detected during the study, including the winter season, and nesting season point count data and incidental observations made during both seasons. The methods and results are described in the attached report (AMEC 2011), and pertinent data are incorporated into this BBCS.

Most of the birds occurring in the project vicinity have no special conservation status (Aspen 2012), but all native birds are protected under the federal MBTA and California Fish and Game Code, as described in Section 1.2 above. In addition to the common birds of the area, a list of special-status bird and bat species with potential to occur in the vicinity of the proposed project was compiled. Species were considered to be special-status species if they were classified as one or more of the following:

- Listed, proposed for listing, or candidates for listing as threatened or endangered under the federal ESA;
- Listed as threatened or endangered, or candidates for listing under CESA;
- Designated by BLM as Sensitive Animals (BLM 2010);
- Meet the definition of rare or endangered under CEQA §15380(b) and (d).
- Considered special-status species in local or regional plans, policies, or regulations, such as the NECO Plan/EIS.

All special-status species identified by this literature review, and others known from the general region, are included in Table 1, which summarizes the natural history, agency status, and occurrence probability on the site for each species.

Creosote Bush Scrub on the site matches the Desert Scrub wildlife habitat described by Laudenslayer and Boggs (1988). Within the project area it provides habitat for wildlife species typical of the California deserts, including burrowing species such as kangaroo rats (*Dipodomys* spp.), pocket mice (*Perognathus* spp., *Chaetodipus* spp.), and desert cottontail (*Sylvilagus audubonii*); and mesopredators such as desert kit fox (*Vulpes macrotis arsipus*) and coyote (*Canis latrans*). This community also serves as habitat for numerous species of reptiles including desert iguana (*Dipsosaurus dorsalis*), sidewinder (*Crotalus cerastes*), desert horned lizard (*Phrynosoma platyrhinos*), Great Basin whiptail (*Aspidocelis tigris tigris*) and zebra-tailed lizard (*Callisaurus draconoides*). Common birds observed within this vegetation included black-throated sparrow (*Amphispiza bilineata*), Gambel's quail (*Callipepla gambelii*), common raven (*Corvus corax*), red-tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*).

Blue Palo Verde-Ironwood Woodland. Blue Palo Verde-Ironwood Woodland occurs throughout the project area primarily in dry washes and is characterized by the presence of desert ironwood (*Olneya tesota*) and blue palo verde (*Parkinsonia florida*). Additional tree species such as smoketree (*Psoralea argophylla*) and cat claw acacia (*Acacia greggii*) also occur but are uncommon. It is one of several communities included within broader vegetation types called desert wash woodland or microphyll woodland (Holland 1986; Schoenherr and Burk 2007). Vegetation in desert washes is generally taller, up to approximately 9m (30 ft) in height, and denser than surrounding desert habitats, with the height of the wash vegetation proportional to the size of the arroyo (Laudenslayer 1988). Understory vegetation within these woodlands is composed of big galleta, cheesebush (*Hymenoclea salsola*), desert lavender (*Hyptis emoryi*) and other shrubs and subshrubs. Blue Palo Verde-Ironwood Woodlands on the site match the desert wash wildlife habitat described by Laudenslayer (1988). This habitat provides greater food, nesting, and cover resources than the surrounding creosote bush scrub, and wildlife diversity is generally greater than in the surrounding desert. Examples of species that depend in part on desert microphyll woodlands include vermilion flycatcher and black-tailed gnatcatcher. In addition, many of the species occupying the surrounding creosote bush scrub are found in greater numbers in microphyll woodlands. This community is ranked by CDFG (2010a) as a special-status vegetation type, with state rarity ranking of S3. There are 180 acres of Blue Palo Verde –Ironwood Woodland on the proposed solar project site. Each of the generator tie-line alternatives would affect a limited additional acreage of this woodland vegetation, depending on the specific locations of access roads, transmission line structures, and work sites.

Creosote Bush Scrub on Partially Stabilized Sand Fields. Creosote Bush Scrub occurs on partially stabilized sand fields in the eastern portion of gen-tie Alternative E. This area is located at the western margin of a much larger dune system associated with Pinto Wash, at the base of the Coxcomb Mountains. This vegetation matches the description of "Creosote Bush Scrub," above, but the cover is much sparser and the substrate consists of partially stabilized sand fields with accumulations of sands mounded at the bases of the shrubs. This habitat is suitable for a series of special status plants and animals, including Mojave fringe-toed lizard, which were reported in the area in the Desert Sunlight EIS and observed there by Aspen field staff. None of this habitat would be affected by solar generator construction, and only generator tie-line Alternative E would affect it. Acreage impacted by Alternative E would be dependent on the specific locations of access roads, transmission line structures, and work sites.

Active Sand Dunes. Active sand dunes are found on gen-tie Alternative E. These dunes are at the western margin of the larger Pinto Wash / Coxcomb Mountains dune system, above. This habitat is characterized by fine aeolian (i.e., wind-blown) sands that support very little vegetation. Vegetation on the dunes is sparse, but dominated by scattered creosote bush and Russian thistle (*Salsola* sp.). None of

(Figure 2). The Desert Sunlight project was recently approved (BLM 2011b; 2011c) and will occupy 3,761 acres when fully built out. Public lands to the west of Kaiser Road, adjacent to the Desert Harvest site, are within a BLM Desert Wildlife Management Area (DWMA), designated in the Northern & Eastern Colorado Desert Coordinated Management Plan (NECO; BLM and CDFG 2002). The Palen-Ford WHMA, also designated in the NECO, is generally east of the site, but approximately 46 acres of the WHMA are within the project site (see Figure 3). Some of the private lands to the south and west have been developed as residential and agricultural lands. These include active and inactive jojoba fields, rural residential lands, and the community of Lake Tamarisk.

Joshua Tree National Park (JTNP) surrounds the upper Chuckwalla Valley on the north, east, and west. To the north, the JTNP boundary is about 7 miles from the northern boundary of the Desert Harvest ROW, and about 4.5 miles north of the approved Desert Sunlight project boundary. The Coxcomb Mountains, in the southeastern corner of JTNP, are located about 1.8 miles northeast of the northeastern corner of the Desert Harvest ROW. To the west, the JTNP boundary is about 3.5 miles from the western boundary of the Desert Harvest site, at Kaiser Road.

3.2 HABITAT

Two vegetation types cover the proposed solar generator site and generator tie-line Alternatives B, C, and D (Figures 5 and 6): Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance) and Blue Palo Verde-Ironwood Woodland (*Parkinsonia florida*-*Olneya tesota* Woodland Alliance) (Sawyer et al. 2009). The Creosote Bush Scrub vegetation is a subset of the Sonoran Creosote Bush Scrub as described by Holland (1986), and Blue Palo-Verde-Ironwood Woodland is a subset of his description of Desert Dry Wash Woodland. Small, closely-spaced, braided ephemeral channels are abundant throughout the project site (Figure 7). There also are small areas within the proposed solar generator site where natural vegetation has been removed or disturbed for roads and other land uses. In most cases (e.g., narrow roads), these areas are too small for mapping at this scale; however, the proposed solar generator site overlaps a narrow area disturbed for date palm agriculture (on an adjacent parcel) in the southeastern corner of the site. This area is mapped as "Disturbed / Disused Agriculture" on Figures 5 and 6.

In addition, disturbed areas are located along the generator tie-line alignments, particularly alignment Alternative D, which crosses disused agricultural lands over part of its length. Generator tie-line alignment Alternative E, located farther to the east, crosses two additional vegetation or habitat types: active sand dunes and creosote bush scrub on partially stabilized sand fields (Figure 6).

Creosote Bush Scrub (bajada/alluvial landforms). Creosote Bush Scrub on the site is characterized by low shrub species diversity and relatively wide spacing of shrubs, usually with bare ground between. The dominant species in this vegetation is creosote bush (*Larrea tridentata*). Associated species include white bursage (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), and big galleta (*Pleuraphis rigida*). This vegetation also supports a diverse assemblage of seasonal annuals, including desert sunflower (*Geraea canescens*), desert dandelion (*Malacothrix glabrata*), several pincushion species (*Chaenactis* spp.) and several species of cryptantha (*Cryptantha* spp.). The areas mapped as Creosote Bush Scrub also include areas of desert pavement with relatively sparse cover of low-statured creosote bush and seasonal annuals such as devil's spineflower (*Chorizanthe rigida*), kidneyleaf buckwheat (*Eriogonum reniforme*), and Emory's rock daisy (*Perityle emoryi*). There are 1,026 acres of creosote bush scrub mapped on the proposed solar project site. Creosote Bush Scrub has no California Department of Fish and Game special-status designation (CDFG 2010a). Each of the generator tie-line alternatives would affect a limited additional acreage of creosote bush scrub, depending on the specific locations of access roads, transmission line structures, and work sites.

Other communications relating to bird and bat conservation include:

- A checklist provided by BLM Renewable Energy Coordination Office in January 2011, listing biological survey needs for the project; the checklist included golden eagle surveys and general avian breeding and winter season point counts;
- enXco, USFWS Carlsbad Fish & Wildlife Office, and Aspen staff discussed baseline golden eagle data recommendations during a conference call on 28 April 2011;
- A letter provided by USFWS, commenting on the project Notice of Intent (NOI) reading, in part:

"Migratory birds are federally protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 et seq.) and under Executive Order 13186 - Responsibility of Federal Agencies to Protect Migratory Birds. Based on the Service's management authority for migratory birds under the MBTA, we also recommend that the EIS include an evaluation of potential impacts to migratory and resident birds, particularly the western burrowing owl. Western burrowing owls have been documented in the project area and we recommend protocol surveys for the species be conducted in support of the EIS analysis. In addition to MBTA, eagles are protected under the Bald and Golden Eagle Protection Act. Active and inactive golden eagle nests were documented in 2010 within close proximity to the proposed project. Since nesting patterns change annually, we recommend providing up-to-date biological information about golden eagles within a 10 mile radius of the project area for the EIS analysis. Please refer to the Interim Golden Eagle Inventory and Monitoring Protocols (Pagel et al. 2010) for appropriate survey methods.

"Finally, to minimize impacts from linear project features, we recommend co-locating these components to the extent practicable with First Solar's Desert Sunlight project. Co-location opportunities include utilizing a common generation tie line alignment, right-of-way, and access roads, and sharing the northernmost boundary security fencing."

- An on-site field meeting, including USFWS staff from the Carlsbad and Palm Springs Fish & Wildlife Offices, and Aspen, on November 17, 2011.

3.0 SITING

3.1 SITE OVERVIEW

The DHSP site is located in the upper Chuckwalla Valley, on public lands administered by the BLM in unincorporated Riverside County, approximately 6 miles north of Desert Center, California (Township 4 South, Range 15 East, Sections 25, 26, 27, USGS 7.5' Victory Pass and East of Victory Pass quadrangles). The Right-of-Way Application consists of two non-contiguous parcels (Figures 1 and 2). The large, northeastern parcel is 1,070 acres and the smaller, southwestern parcel is 270 acres. Portions of each parcel extend to the west of Kaiser Road (County Route R2); enXco does not propose to construct solar facilities within the Kaiser Road right of way, or west of Kaiser Road. With these areas excluded from the analysis, the total solar facility project area is approximately 1,208 acres, consisting of 1051 acres in the larger parcel, and 157 acres in the smaller one.

The site is now undeveloped, natural open space. The surrounding area consists primarily of public lands managed by the BLM, with scattered smaller private land parcels to the south and east. The Desert Sunlight Solar Project, now under construction, is located to the immediate north of the DHSP site

other activities (Fish and Game Code § 3511). Unlike the subsequent CESA and ESA, there was no provision for authorized take of designated fully protected species. Currently, 36 fish and wildlife species are designated as fully protected, including golden eagle and several other desert species.

California Senate Bill 618 (signed by Governor Brown in October 2011) authorizes take of fully protected species, where pursuant to a Natural Communities Conservation Plan approved by CDFG. The legislation gives fully protected species the same level of protection that is provided under the Natural Community Conservation Planning Act for endangered and threatened species (below).

Natural Community Conservation Planning Act (Fish and Game Code Sections 2800-2835). The Natural Community Conservation Planning (NCCP) Act of 1991 (amended in 2002) was established to provide a regional approach to conservation for multiple species, in contrast to the single-species approach implemented under CESA and ESA. The NCCP Program is implemented by CDFG as a cooperative effort by the State of California and private and public partners, designed to protect species and their habitats through an ecosystem approach. The program helps identify and provide for large area-wide protection of plants, animals, and their habitats while allowing for compatible and appropriate economic activity.

The NCCP Act promotes conservation of unfragmented habitat areas, promotes multispecies and multihabitat management and conservation, and promotes the conservation of broad-based natural communities and species diversity. It provides an option for identifying mitigation that is proportional to a project's impacts to biological resources. Participation in the NCCP program is a voluntary mechanism that can provide an early planning framework for proposed development projects.

The Desert Renewable Energy Conservation Plan (DRECP) is being developed by BLM, USFWS, CDFG, and the California Energy Commission (CEC). It is intended to protect California desert ecosystems (including the project area), while allowing for appropriate development of renewable energy projects. The DRECP is scheduled to be completed in 2012. The DRECP, upon completion, will be an NCCP. The DHSP site is within the geographic area to be covered by the DRECP.

2.0 AGENCY COORDINATION

enXco has initiated a series of meetings with state and federal resource agencies (BLM, USFWS, and CDFG) to discuss environmental review of the DHSP, including review of potential impacts to native birds, and minimization or mitigation of those impacts. Meetings and other communications relative to this Bird and Bat Conservation Strategy took place on:

- November 5, 2010 – Meeting at BLM Palm Springs Field Office, including representatives from enXco, BLM Palm Springs Field Office, USFWS Carlsbad Fish & Wildlife Office (by phone), and Aspen;
- April 20, 2011 - Meeting at BLM Palm Springs Field Office, including representatives from enXco, BLM Palm Springs Field Office, USFWS Carlsbad Fish & Wildlife Office, Marine Corps Air Station 29 Palms, Joshua Tree National Park, and Aspen;
- June 22, 2011 – Presentation by enXco to REAT member agencies at California Energy Commission, Sacramento, including representatives from enXco, BLM Palm Springs Field Office, USFWS Carlsbad Fish & Wildlife Office, CDFG Inland Deserts Region and Aspen;
- Weekly agency coordination conference calls, beginning August 29 2011, participants vary.

species). Under the MBTA, *migratory bird* is broadly defined as “any species or family of birds that live, reproduce or migrate within or across international borders at some point during their annual life cycle” and thus applies to most native bird species. Except where specifically permitted, most actions that cause bird mortality or result in the permanent or temporary possession of migratory birds or any associated body parts, feathers, eggs or nests, constitute violations of the MBTA.

The USFWS recommends that electric utilities and utility-scale renewable energy project developers prepare and implement Bird and Bat Conservation Strategies to minimize the incidental take of migratory birds.

Bald and Golden Eagle Protection Act. The Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d; BGEPA) prohibits take of bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*). The BGEPA defines ‘take’ to include “pursuing, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting, and disturbing.” The USFWS (2007) further defines ‘disturb’ as “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.” Therefore, the requirements for guarding against impacts to eagles generally are more stringent than those required by the MBTA alone.

The USFWS can authorize take of bald and golden eagles when the take is associated with, but not the purpose of, an otherwise lawful activity, and cannot practicably be avoided (50 CFR § 22.26). In order to authorize take, the USFWS must determine that the proposed action is consistent with the goal of maintaining stable or increasing breeding populations. That is, any authorized take must be offset or mitigated by the proposed action.

1.2.2 State Regulations

California Endangered Species Act. The California Endangered Species Act (CESA) prohibits take of wildlife listed as threatened or endangered and defines ‘take’ as any action or attempt to “hunt, pursue, catch, capture, or kill.” CESA also allows exceptions for take that occur incidental to otherwise lawful activities. Approval requires minimization and full mitigation of projected impacts. For projects that affect a species listed under both CESA and the federal ESA, compliance with the federal ESA will satisfy CESA if CDFG determines that the federal incidental take authorization is consistent with CESA under Fish and Game Code § 2080.1. For projects that will result in take of a species listed under CESA but not under the federal ESA, the applicants must apply for a take permit under § 2081(b).

Native Birds (California Fish and Game Code, Sections 3503 and 3513). California Fish and Game Code § 3503 prohibits take, possession, or needless destruction of bird nests or eggs except as otherwise provided by the Code; § 3503.5 prohibits take or possession of birds of prey or their eggs except as otherwise provided by the Code; and § 3513 provides for the adoption of the MBTA’s provisions (above). With the exception of a few non-native birds such as European starling, the take of any bird or loss of active bird nests or young is regulated by these statutes. As with the MBTA, these statutes offer no statutory or regulatory mechanism for obtaining an incidental take permit for the loss of non-game migratory birds.

California Fully Protected Species. Prior to enactment of CESA and the federal ESA, California enacted laws to “fully protect” designated wildlife species from take, including hunting, harvesting, and

maintenance would involve periodic inspection via helicopter or truck. The transmission lines would be maintained on an as-needed basis and would include maintenance of access roads and erosion/drainage control structures.

Decommissioning. A final Decommissioning Plan would be developed prior to facility closure, based on conditions at that time. The Decommissioning Plan would be developed in coordination with the BLM and submitted to the BLM for review and approval prior to final closure.

1.1.7 Gen-tie Alternatives

In addition to the proposed gen-tie alignment, three other alignments are under review (alternatives C, D, and E in the DHSP EIS; see Figure 2). Alternative C would be constructed on separate towers immediately adjacent to the approved Desert Sunlight gen-tie line; gen-tie alignment Alternative D, or the cross-valley alignment, was described in the Desert Sunlight EIS as Alternative A-2; and gen-tie alignment Alternative E is a new alternative that was not reviewed in the Desert Sunlight EIS. The transmission support structures, construction activities, and other aspects of construction for gen-tie Alternatives C, D, and E would be as summarized above for the proposed gen-tie.

1.2 REGULATORY SETTING

This BBCS was prepared to ensure Project compliance with state and federal statutes protecting native birds, as well as NEPA and CEQA requirements to disclose environmental effects of the project, and provide public opportunity for comment. These applicable statutes are summarized below:

1.2.1 Federal Regulations

Endangered Species Act of 1973. The Endangered Species Act (ESA) (16 USC 1531 et seq.) and subsequent amendments establish legal requirements for the conservation of endangered and threatened species and the ecosystems upon which they depend. Section 9 prohibits the take of any fish or wildlife species listed as endangered and most species listed as threatened, and defines *take* to mean “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” *Harm* is further defined to mean “any act that kills or injures the species, including significant habitat modification.” *Harass* is further defined as actions that create the likelihood of injury to listed species to an extent as to significantly disrupt normal behavior patterns which include breeding, feeding, and shelter.

The ESA also includes mechanisms for allowing exceptions to the Section 9 take prohibitions. Section 7 requires federal agencies, in consultation with the US Fish and Wildlife Service (USFWS) to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered terrestrial wildlife species or result in the destruction or adverse modification of critical habitat for these species. Under Section 7, USFWS may authorize limited, incidental take (i.e., incidental to carrying out otherwise lawful activities) of listed species in a Biological Opinion.

The project is not expected to affect federally listed threatened or endangered bird or bat species, though it is possible that such federally listed migratory species may be found in the project vicinity during seasonal migrations.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act (16 U.S.C. §§ 703, et seq.; MBTA) prohibits the taking, killing, possession, transportation and importation of migratory birds, their eggs, parts, and nests, except where specifically authorized by the USFWS (e.g., hunting waterfowl and upland game

Alternative 6 – Reduced Footprint Solar Project: Alternative 6 would have the same project boundaries as the proposed project, except that it would exclude the smaller southern parcel of the project, as shown on Figure 4b, Alternatives to the Proposed Action. Alternative 6 would encompass approximately 1,044 acres. Because Alternative 6 would not include the disjunct ROW parcel, it would not require an underground electrical connection between southwestern and northeastern parcels described for the proposed project. Alternative 6 would not incorporate any substantial changes to construction, O&M, or decommissioning from those described above. Direct and indirect impacts would be similar in type as those presented above for the proposed action, but would be incrementally reduced in magnitude due to the 164-acre reduction in the size.

1.1.6 Gen-tie line

The proposed gen-tie, Alternative B, is the same gen-tie line as proposed by the approved adjacent Desert Sunlight project and described in the Desert Sunlight EIS (BLM 2011b) as Alternative A-1. Because the Desert Sunlight gen-tie has not yet been constructed (as of December 2011), the effects of constructing, operating, and decommissioning gen-tie Alternative B are analyzed in the EIS and described here without the presumption that the approved Desert Sunlight gen-tie would be built. However, if the Desert Sunlight gen-tie line were to commence construction prior to or at the same time as the construction schedule for the proposed action, then the proposed gen-tie line would instead consist of an additional line strung on the gen-tie line towers of the Desert Sunlight project. Under such a scenario, stringing of enXco's gen-tie line would occur concurrently with construction of Desert Sunlight's gen-tie line, and would require no additional equipment, personnel, or time beyond that already required and approved for Desert Sunlight's gen-tie line. The same access roads would be used for maintenance of both companies' conductors, and the conductors would be maintained concurrently using the same maintenance service provider. The proposed alignment is shown on Figures 1 and 2. The gen-tie line would be on steel monopoles, which would be approximately 135 feet tall. Typical spans between poles would be approximately 900 to 1,100 feet.

Construction scheduling and mobilization. Construction would begin 3rd or 4th quarter, 2012 (depending on Record of Decision [ROD] issuance) and would last for 12 months. Gen-tie construction would occur concurrently with Desert Sunlight, if feasible. Over a 12 month construction period, the gen-tie workforce will average 30 employees, with no more than 65 employees at any one point. A total of approximately 240 material deliveries are expected during the 12 month construction period for the gen-tie line.

Work site and access road clearing. Access roads and work areas at each structure location would be cleared and graded. Clearing and grading would also be needed for conductor pulling and tensioning sites and temporary guard structure sites at road or utility crossings. Laydown yards would all be within the project footprint and would not require any additional ground disturbance. The total area of permanent and temporary disturbance is estimated as 92 acres.

Tower construction. Structures would be picked up from the material storage yard, hauled to tower locations or marshalling yards. The pole base and top sections of each structure would be assembled in sections on the ground, using hydraulic cranes. After assembly, each structure would be erected onto a foundation (either shaft anchor-bolted foundations, drilled shaft embedded foundations, or vibrated steel casings), using a crane.

Operations and maintenance. DHSP operations and maintenance personnel would perform periodic maintenance of the gen-tie line, and no additional personnel would be required. Operation and

1.1.3 Operations and Maintenance Activities

Staff and equipment. The project would employ 8 full-time staff during operations. Maintenance staff would access the facility using 4 diesel engine pickup trucks. The trucks would travel to the site daily from an off-site O&M building (located within 10 miles of the site) or an optional on-site building.

Roads and vegetation. Operations and maintenance (O&M) of the facility would require periodic access to the project components via the on-site road network. Roads would be maintained to minimize fugitive dust and prevent erosion. Additional gravel or surface treatments may be required. Vegetation would be allowed to re-grow within the solar panel field, but would be maintained below a height of 18 inches to prevent interference with solar panels. The access roads in the solar panel field would be maintained free from significant vegetation through the use of targeted spraying, occasional scarifying, or weeding to reduce fire hazard and allow access to the panel arrays.

Operational water requirements and sources. During operation, water would be required for solar panel washing two to three times per year. If off-site wells are used, water would be trucked to the project site from up to 10 miles away in up to 1,200 water trucks annually. Panel wash water would be purified using the on-site reverse osmosis system (above). The total water used would be between 18 and 27 acre-feet per year. Domestic wastewater would be treated and disposed at the site using a septic disposal system consisting of septic tanks and leach field.

Aviation Lighting. enXco anticipates no aviation restrictions for the project. No structures would be taller than the height requiring aviation lighting.

1.1.4 Decommissioning Activities

The expected operational lifetime of the project is 30 years; however, the actual life of the project could be longer or shorter. When permanent closure is appropriate, a decommissioning plan will be prepared and submitted to the BLM for review and approval. Closure strategies may include temporary “mothballing”; removing old facilities and upgrading to newer solar technology; or complete removal of equipment and restoration of the land to BLM-approved specifications. Fully decommissioning the site would involve removal and demolition of above-ground and below-ground structures; dismantling and removing concrete structures to a depth of 3 feet; removal of underground utilities within 3 feet of final grade; and excavation and removal of contaminated soils, if applicable.

1.1.5 Project Alternatives

In addition to enXco’s proposed project, the DEIS addresses two smaller solar field designs. Both alternatives would be located at the same ROW. These action alternatives are summarized below.

Alternative 5 – Solar Project Excluding WHMA: Alternative 5 would have the same project boundaries as the proposed project, except that it would exclude the portion of the site which is within the Palen-Ford Wildlife Habitat Management Area (WHMA), as shown on Figure 4a, Alternatives to the Proposed Action. Alternative 5 would encompass approximately 1,161 acres. It would not incorporate any substantial changes to construction, O&M, or decommissioning from those described above. Direct and indirect impacts would be similar in type as those presented above for the proposed action, but would be incrementally reduced in magnitude due to the 47-acre reduction in the size of the Alternative 4 site.

Construction vehicles and equipment. During construction, the number of truck loads and the tonnage delivered would be on the order of about 15,000 tons of equipment and materials. Construction equipment would include front end loaders (3), backhoes (8), scrapers (5), bulldozers (2), graders (5), hydraulic rams (10), cranes (2), power screeners (3), and pile drivers (10).

Vegetation removal and treatment. Once fencing is erected, site preparation would consist of removal of vegetation within the project area by scarification where necessary; for example, along the access roads. Approximately 10 percent of the entire project area would be scarified to remove vegetation on all the access roads between the 1.44 MW rows of solar panels. In addition, any vegetation over 18 inches tall would be removed to avoid interference with the solar panels. Preparation would likely proceed by section, so that only the portion of the project area where panels would be laid out over a period of 6 months would be scarified at any one time.

Key considerations for vegetation treatment of the site would include:

- Soil disturbance in support of construction would increase the possibility of introduction of invasive species. Regular monitoring and weed management would be required during construction. Ongoing maintenance in the solar field may include treatment of noxious weeds by targeted spraying with Roundup® (a common formulation of the herbicide glyphosate). Pursuant to BLM requirements, an Integrated Weed Management Plan will be prepared and implemented for the project.
- Where temporary access is needed to install facilities, such as along the perimeter fencing, no removal of existing vegetation or grading would occur. Instead, equipment would drive over or around existing desert scrub vegetation without direct removal. Crushed vegetation is much more likely to show a rapid recovery than where vegetation is removed and reseeded, or where soils are disturbed. The Applicant is not expecting that final plans would require any disturbance outside the final perimeter fencing.
- Revegetation with native species would be implemented where feasible in areas of temporary disturbance. Pursuant to BLM requirements, a Revegetation Plan will be prepared and implemented for areas temporarily disturbed during project construction.

Solar array assembly and construction. After site preparation, the panel field would be laid out by installing the vertical H-pile galvanized steel beams directly into the ground by means of a small pile-driver. If further foundations are required, then the vertical H-pile galvanized steel beams would be attached to concrete ballasts. Once the foundations are secure, trenching would be dug along the perimeter of the 1.44 MW units, to tie the inverter blocks together, and the electrical conduit and wires would be laid down. Next, the framing would be bolted to the vertical support beams. Once framing is complete, panels would be installed on the frames. Finally, the pre-poured concrete inverter pads would be laid down and the inverters would be secured to the pads, and the electrical wiring would be completed.

During construction, electric power for construction activities would be derived from the distribution lines along the southern side of the project site, or by mobile generators. Up to five mobile generators would be located at the laydown area (at the northwest corner of the site). Each generator would produce 60 dB(A) of noise at 23 feet.

be used during project operation to contain storm water runoff. Storm water pollution prevention BMP controls would be incorporated with the retention basins.

The ponds would be filled by pumps running 24 hours per day at up to 600 gallons per minute. A float valve in each pond would control overflow. Water would be pumped from the pond into large temporary storage tanks (stand tanks) using hurricane pumps. Water would be transferred directly to trucks from the stand tanks, as needed for dust control and compaction during construction.

Reverse osmosis system. A water treatment facility and demineralization evaporation pond may be required to treat well water, depending upon total dissolved solids (TDS) content. Panel washing requires water with very low TDS. A water treatment system consisting of a double-pass reverse osmosis (RO) system may be installed near the main O&M well, most likely adjacent to the on-site project substation. It would be enclosed in a small structure approximately 6 feet wide by 12 feet deep and approximately 6 feet high. This system would produce up to approximately 20 gallons per minute (gpm) of low-TDS water and approximately 9 gpm of reject water. This reject water would be piped to a lined evaporation pond with four sections comprising approximately 1 acre total. Residue would be periodically removed from the ponds and disposed of at an approved facility. enXco would re-purpose one of the construction holding ponds as a settling pond for RO reject water.

Gravel, aggregate, and concrete requirements and sources. Gravel would be required for the north-south access roads (not for the less often used east-west routes) and would be sifted from on-site soil, or obtained from a BLM-approved commercial mine approximately 6 miles from the project site. Road aggregate required for the on-site access roads would amount to 17,500 cubic yards.

Concrete would be required for the inverter pads and the switchyard. Concrete for the inverter pads and vertical H-pile supports, if needed, would be pre-poured and transported to the site by truck. Concrete for the switchyard and asphalt for the parking area would be trucked to the site. If commercial ready-mix concrete supply is not sufficient, a temporary, two-acre concrete batch plant would be installed in the construction laydown area.

1.1.2 Construction Activities

Construction schedule and phasing Site preparation would begin shortly after final permitting is complete. Construction is anticipated to commence during the 3rd quarter of 2012, and continue through the 4th quarter of 2014, in two phases. Commercial operation would also be phased and the first phase of operation would commence during the 3rd quarter of 2013, with commercial operation of the final phase commencing during the 4th quarter of 2014. The construction schedule would be as follows:

Construction would generally occur between 7 a.m. and 7 p.m., Monday through Friday. Additional hours may be necessary at times, due to weather or specific construction activities.

Construction workforce. The on-site workforce would consist of laborers, craftsmen, supervisory personnel, supply personnel, and construction management personnel. The maximum number of on-site personnel would be 250 individuals at any one time during construction. An average workforce of 100 is anticipated during construction.

Construction waste management. Portable bathrooms would be provided on-site during construction and would be emptied in an approved off-site facility; domestic wastewater generated during construction would not be disposed of on-site.

service poles approximately 18 feet in height. Power would come from a connection to the local distribution system or from an on-site generator. If required, construction lighting would be limited to that needed to ensure safety. It would be focused downward, shielded, and directed toward the interior of the site to minimize light exposure to areas outside the construction area.

During operations, lighting would be limited to shielded, area-specific lighting for security purposes. Power would come from the local distribution system. The level and intensity of lighting during operations would be the minimum needed for security and safety purposes. Security lights would use motion sensors that would be triggered by movement. There would be no lights around the project perimeter, in order to minimize the project's visual impact on surrounding receptors and roads. Lights would be shielded and focused downward and toward the interior of the site to minimize lighting impacts on the night sky and to neighboring areas. Portable lighting may be used occasionally for maintenance activities during operations.

Access roads. Access would be via the existing Kaiser Mine Road, at the western boundary of the project area. Kaiser Mine Road is reached from Rice Road, just north of the on-ramp/off-ramp to Interstate 10 at Desert Center. The primary point of access to the project site would be a 20 foot-wide access road connecting the northwest corner of the solar facility to Kaiser Mine Road. Access within the project area would be provided by a grid of 14 to 20-foot wide unpaved roads to allow fire and maintenance access. The total length of on-site roads would be 109 miles.

Water requirements and sources. During the construction period, an estimated total of between 400 and 500 acre-feet of water would be needed for such uses as soil compaction, dust control, and sanitary needs. The majority of the construction water use would occur during site grading operations. The daily water demand during construction is estimated to range from a low of 125,000 gallons per day (gpd) to a peak of approximately 600,000 gpd. enXco proposes to draw water from two new and/or existing local wells to meet construction water demands. One well would continue to be used for project operations. Both wells would be available for use during construction to provide flexibility in the water supply and in the event of a well malfunction. The project's maximum well extraction rate over any 24 hour period is not expected to exceed 880 gallons per minute. Drinking water would be provided from an off-site commercial source during construction. A permanent, above-ground 5,000 gallon water storage tank would be built for O&M and as an emergency fire-fighting supply. The water tank would be about 12 feet in diameter and 13 feet tall and would be located on a round concrete slab.

The potential locations for the construction of two new on-site wells are at the northeastern and northwestern areas of the site. As an alternative to new wells, DHSP may use nearby (within 10 miles) off-site active wells. If off-site wells are used, water would be trucked to the on-site water treatment facility described below. No new roads or ground disturbance would be required for use of off-site wells.

Temporary ponds would be used for water storage during construction. A total of 3 temporary ponds are planned around the project construction site. It is anticipated that each pond would occupy approximately three-quarters of an acre and would hold approximately 21.5 million gallons. Ground water pumped from the supply wells would be piped the ponds via 6 inch HDPE pipe runs along on-site access roads or the site perimeter. No more than two or three ponds would be operating at any one time. The temporary ponds would be approximately 6 to 8 feet deep and would be fenced and lined for safety. The temporary ponds would be covered with netting to deter ravens and other wildlife. To minimize earth work, most of the ponds would be co-located with planned retention basins that would

Each PV combining switchgear would be placed on pre-cast 32 foot by 14.5 foot concrete pads, delivered and installed in the same manner as transformer pads and power conversion station vaults.

Because the project site is comprised of two separate parcels, electrical connection between the southern parcel and on-site substation would be required. The Applicant would seek to under-ground the electrical power conversion station connections from the southern parcel to the northern parcel along an easement on the eastern side of Kaiser Road. The route would parallel the natural gas line adjacent to Kaiser Road.

Overhead collection lines. High-capacity 34.5 kV collection system lines would connect the power output from the PV combining switchgear to the on-site substation via overhead lines. These overhead lines would be supported by wooden poles approximately 52 feet above finished grade. The overhead lines would span a distance of approximately 150 feet from pole to pole.

On-site substation. The project substation would be located in the northwest corner of the site and would cover approximately 5 acres. It would step up voltage of the solar-generated electricity to 220 kV. The project's primary 20 foot-wide access road would serve the on-site substation.

Switchyard. An electrical switchyard serves to interconnect an electrical generator to the grid. The switchyard would be constructed and operated by enXco. It would occupy an area approximately 400 feet long and 400 feet wide in the west corner of the northern parcel immediately adjacent to the substation. Transformer(s) in the switchyard would be set on concrete pads within containment areas designed to hold any accidental releases of transformer oil. All transformers would be free of polychlorinated biphenyls. The high-voltage side of the transformer(s) would be connected to the plant's switchyard.

A small control building would be located within the switchyard and would be accessible to authorized personnel only. The building would house electrical control equipment, battery/DC systems for device operation, safety relays, and other similar electrical equipment. This building would interconnect with the main control room in the operations building for monitoring of the substation.

Security fencing. Beginning at the onset of construction, site access would be controlled for personnel and vehicles. A security fence would be installed around the plant site perimeter. An access gate would be located in the west corner. An emergency gate would be located in the southeast corner, with access to Beekley Road (north of Rice Road, west of Carr Road). The security fence would have an overall height of no more than 10 feet, including chain link fabric and three strands of barbed wire mounted on 45 degree extension arms. All required laydown areas are expected to be within the defined solar facility boundaries, and thus no additional temporary fencing would be required.

Controlled swing or rolling access gates, requiring an electronic swipe card, would be located at the facility entrance. Visitors would be allowed entry only with approval from staff, issued passes to be worn during their visit, and would be logged in and out of the facility.

Lighting and Electrical Supply. Additional security features would include motion detectors, lighting, and cameras in key locations. Exterior lighting would comply with current Title 24 regulations from the State of California. Security would be maintained as required by the engineering, procurement, and construction (EPC) contractor or a suitable subcontractor to maintain public safety and the security of the facilities.

Except as provided below, lighting during construction would be limited to the staging area for the construction trailers, parking area, and site security facilities. Lighting would be located on temporary

northeast, southeast). Within each quadrant, there would be 6 rows of 10 or 11 48-panel strings, arranged in a 6 by 8 table layout. Each block would employ two 720 kW inverters, set along the access roads, in the middle of the panel array area.

The panel field would be laid out by installing vertical H-pile galvanized steel beams directly into the ground by means of a small pile-driver or, if soil conclude that further foundations are required, then the vertical H-pile galvanized steel beams would be attached to concrete ballasts.

The rows of panels would be spaced to prevent shading of adjacent panel rows and to allow access between the rows for panel maintenance. Between each 720 kW power block would be 14- to 20 foot-wide roads running east-to-west, and 14 foot-wide roads running north-south to allow fire and vehicular access for the maintenance of the electrical facilities.

Meteorological station. One or more meteorological stations would be installed at the solar facility site prior to construction in order to track weather patterns. The meteorological station(s) would be attached to a data acquisition system to collect data for analysis and system monitoring. Each meteorological station would be 6 feet in height and would be set on a stainless-steel tripod base approximately 10 feet by 10 feet.

Electrical collection system. Most of the electrical collection system conductors would be underground. Power from several rows of PV modules would be conveyed to power conversion stations via underground direct current (DC) cables. DC trenches would be approximately 3 feet deep and from 1.5 to 2.5 feet wide; the DC cables would be surrounded by clean fill, and the remainder of the trench would be back-filled with native soil and compacted to 90 percent (95 percent when crossing under roadways). Power screeners may be used on site to extract the required clean fill from native soils excavated during trenching for use as bedding material in the trenches. A power screener is a motorized piece of equipment that uses moving screens to filter soils to a particular granularity.

A power conversion station and transformer would be located within each PV array. Each power conversion station comprises an inverter located within an enclosure and (approximately 11.5 feet tall) connected to a transformer. The transformers would be approximately 6.3 feet tall. Each transformer would be placed on a pre-cast concrete pad. Each pad would be delivered by flatbed truck during construction, in combination with a power conversion station vault, and installed by crane from the truck.

The PV inverters would convert the DC electric input into grid-quality alternating current (AC) electric output. The transformer would step up the voltage of the AC electrical input and then would transmit the power via underground lines to the PV combining switchgear. AC trenches would be approximately 3 feet deep and from 8 inches to 6.5 feet wide, depending on the number of cables, and would also be used to house fiber optic cables. The AC cables would be surrounded by sand, and the remainder of the trench would be back-filled with native soil and compacted.

The PV combining switchgear would transmit the power to overhead lines within the solar facility site; the overhead lines would transmit the electrical output to the on-site substation. At the on-site substation, the voltage would be stepped up to 220 kV and routed via a new gen-tie line to the approved Southern California Edison (SCE) Red Bluff Substation (the alternative gen-tie lines are described below).

Each PV combining switchgear would collect power from a number of arrays. The PV combining switchgear cabinets would be approximately 7.5 feet tall and would be dispersed among the arrays.

Table 1. Estimated Overall Project Acreage

Project Component	Acreage
Current BLM right-of-way case record (Northern Parcel / Southern Parcel; respectively)	1,208 (1,053 / 155)
Solar panel field	1,200
Area cleared of vegetation (10% of Project area)	107
Parking and admin areas	3.0
Access corridors	200
Construction laydown area	2
Gravel access roads	10
On-site substation	3
Area disturbed by trenching	11
Area permanently covered by at-grade items (footprint of piles, power conversion station, transformer, PV combining switchgear, on-site substation, on-site overhead line poles, Visitors Center, M&M Facility)	10
Water storage ponds	2
Approximate maximum area shaded by PV modules	910

The specific PV technology to be installed has not been determined. The project may use any of a variety of PV technologies, including, but not limited to:

- Crystalline silicon panels
- Copper indium gallium cyanide selenide panels
- Fixed-tilt racking system
- Single-axis tracking system

The PV modules would be organized into arrays that would be spread out over approximately 1,200 acres of the site. Each megawatt requires approximately 8 acres. Each array would consist of PV modules, a power conversion station, and a transformer. Tracking systems, which may be installed, have motors that rotate the PV modules from east to west during the day to track the sun across the sky.

enXco proposes to use site preparation techniques that would minimize the required volume of earth movement, including a “disc and roll” technique that uses farm tractors to till the soil over much of the solar facility site and then roll it level, as well as “micrograding” or “isolated cut and fill and roll” of other areas of the site to trim off high spots and use the material to fill in low spots. The entire solar field would be impacted by some form of soil disturbance, either from compaction, micro-grading, or disc-and-roll grading. Panel foundations would permanently disturb 10 acres of on-site soils. Internal access roads would permanently disturb 210 acres. Installed panels would shade up to approximately 910 acres of the solar facility acreage.

The field of panels would consist of repeating blocks of 1.44 MW (AC). The approximate dimensions of each array block would consist of 12,480 panels, separated into four quadrants (northwest, southwest,

1.0 INTRODUCTION

enXco proposes to develop the Desert Harvest Solar Project (DHSP) on 1,208 acres of public lands administered by the Bureau of Land Management (BLM) in unincorporated Riverside County, approximately 6 miles north of Desert Center, California. The BLM and the County of Riverside are reviewing the Project, pursuant to the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) (BLM 2011a). enXco is voluntarily proposing this Bird and Bat Conservation Strategy to set forth the measures it will implement to avoid, minimize, or mitigate for potential adverse effects of the Project to birds or bats. Accordingly, enXco will collect and evaluate data during the construction, operation and maintenance (O&M), and decommissioning phases of the Project and will implement adaptive management measures as necessary and appropriate to minimize or mitigate impacts to birds or bats. enXco does not anticipate that construction, operations, or decommissioning of the project will cause unauthorized take or prohibited disturbance of bird or bat species.

This Bird and Bat Conservation Strategy (BBCS) was prepared according to guidelines recommended by the US Fish and Wildlife Service (USFWS 2010a; 2010b). It describes the proposed DHSP Project components, summarizes baseline data regarding birds and bats in the Project vicinity; assesses potential risks to those species that could result from Project construction, operation, and decommissioning; and describes conservation measures to be implemented, to minimize those risks.

1.1 PROJECT DESCRIPTION

The DHSP would be located on BLM-administered land north of Desert Center in Riverside County (Figures 1 and 2). Several designated wildlife management areas are in the vicinity of the applicant's right-of-way (ROW; Figure 3). Portions of the proposed and alternative generator transmission lines (gen-tie lines) are within a designated Desert Wildlife Management Area (DWMA) and critical habitat (both designated for desert tortoise). The project's Draft Environmental Impact Statement (DEIS) analyzes 3 solar project alternatives and 4 gen-tie line alternatives. This section of the BBCS summarizes the applicant's proposed project and the alternatives. More complete descriptions of the Project and alternatives may be found in Chapter 2 of the DEIS.

1.1.1 Structures and Facilities

Solar field. The DHSP would be a 150 MW nominal capacity, alternating current (AC) solar photovoltaic (PV) energy-generating project. The proposed project site is comprised of two separate parcels separated by a desert wash. The northern parcel consists of 1,053 acres and the southern parcel consists of 155 acres. The proposed solar facility would consist of several main components. Table 1 presents a breakdown of site acreage for each solar facility component.

- Main generation area—PV arrays, switchyard, inverters, overhead lines, and access corridors;
- Operations and maintenance (O&M) Facility – either on or off site;
- On-site electrical substation; and
- Site security, fencing, and lighting.

FIGURES

Figure 1. Regional Map.

Figure 2. Project and Vicinity.

Figure 3. Wildlife Management Areas.

Figure 4a. Alternative 4, Solar Project Excluding WHMA.

Figure 4b. Alternative 5, Reduced Footprint Solar Project.

Figure 5. Vegetation, DHSP Site.

Figure 6. Vegetation, Gen-tie Line Alternatives.

Figure 7. CDFG Jurisdictional Streambeds.

ABBREVIATIONS AND ACRONYMS

Alternating current	AC
Bald and Golden Eagle Protection Act	BGEPA
Bird and Bat Conservation Strategy	BBCS
Bureau of Land Management	BLM
California Burrowing Owl Consortium	CBOC
California Environmental Quality Act	CEQA
Desert Harvest Solar Project	DHSP
Desert Wildlife Management Area	DWMA
Direct current	DC
Draft Environmental Impact Statement	DEIS
Engineering, procurement and construction	EPC
Federal Endangered Species Act	ESA
Gallons per day	GPD
Generator tie line	gen-tie line
Kilowatt	kW
Megawatt	MW
Migratory Bird Treaty Act	MBTA
National Environmental Policy Act	NEPA
Natural Community Conservation Planning Act	NCCP
Operation and maintenance	O&M
Photovoltaic	PV
Record of Decision	ROD
Right-of-way	ROW
Total dissolved solids	TDS
US Fish and Wildlife Service	USFWS
Wildlife Management Habitat Area	WHMA

Table of Contents

ABBREVIATIONS AND ACRONYMS	1
FIGURES	1
1.0 INTRODUCTION.....	2
1.1 PROJECT DESCRIPTION	2
1.2 REGULATORY SETTING.....	11
2.0 AGENCY COORDINATION	13
3.0 SITING	14
3.1 SITE OVERVIEW.....	14
3.2 HABITAT	15
4.0 BIRD AND BAT SPECIES OF THE PROJECT VICINITY	17
4.1 INFORMATION COMPILED TO DATE (PRE-CONSTRUCTION SURVEYS)	17
4.2 LISTED THREATENED OR ENDANGERED SPECIES	21
4.3 SPECIES PROTECTED UNDER THE FEDERAL BALD AND GOLDEN EAGLE PROTECTION ACT	22
4.4 SPECIES FULLY PROTECTED UNDER THE CALIFORNIA FISH AND GAME CODE.....	23
5.0 RISK ASSESSMENT	26
5.1 BURNING FROM CONCENTRATED LIGHT AT SOLAR ARRAYS.....	27
5.2 TRANSMISSION LINE, DISTRIBUTION LINE, POWER TOWER, METEOROLOGICAL TOWER, OR GUY LINE COLLISION.....	27
5.3 ELECTROCUTION POTENTIAL.....	28
5.4 TERRITORY ABANDONMENT	28
5.5 NEST AND ROOST SITE DISTURBANCES.....	29
5.6 HABITAT LOSS AND FRAGMENTATION.....	30
5.7 DISTURBANCE DUE TO ONGOING HUMAN PRESENCE AT THE FACILITY	32
5.8 ADDITIONAL RISK FACTORS	32
5.9 CUMULATIVE IMPACTS.....	33
6.0 CONSERVATION MEASURES	34
6.1 APPLICANT PROPOSED MEASURES	34
6.2 DEIS MITIGATION MEASURES.....	36
7.0 MONITORING AND REPORTING	38
7.1 BIRD AND BAT MONITORING REQUIREMENTS OF THE DEIS.....	38
7.2 DESERT HARVEST BIRD AND BAT MONITORING APPROACH AND STRATEGY.....	38
8.0 ADAPTIVE MANAGEMENT.....	40
LITERATURE CITED	40

Draft Bird and Bat Conservation Strategy

Desert Harvest Solar Project

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January 2012

Appendix C.9

Draft Bird and Bat Conservation Strategy

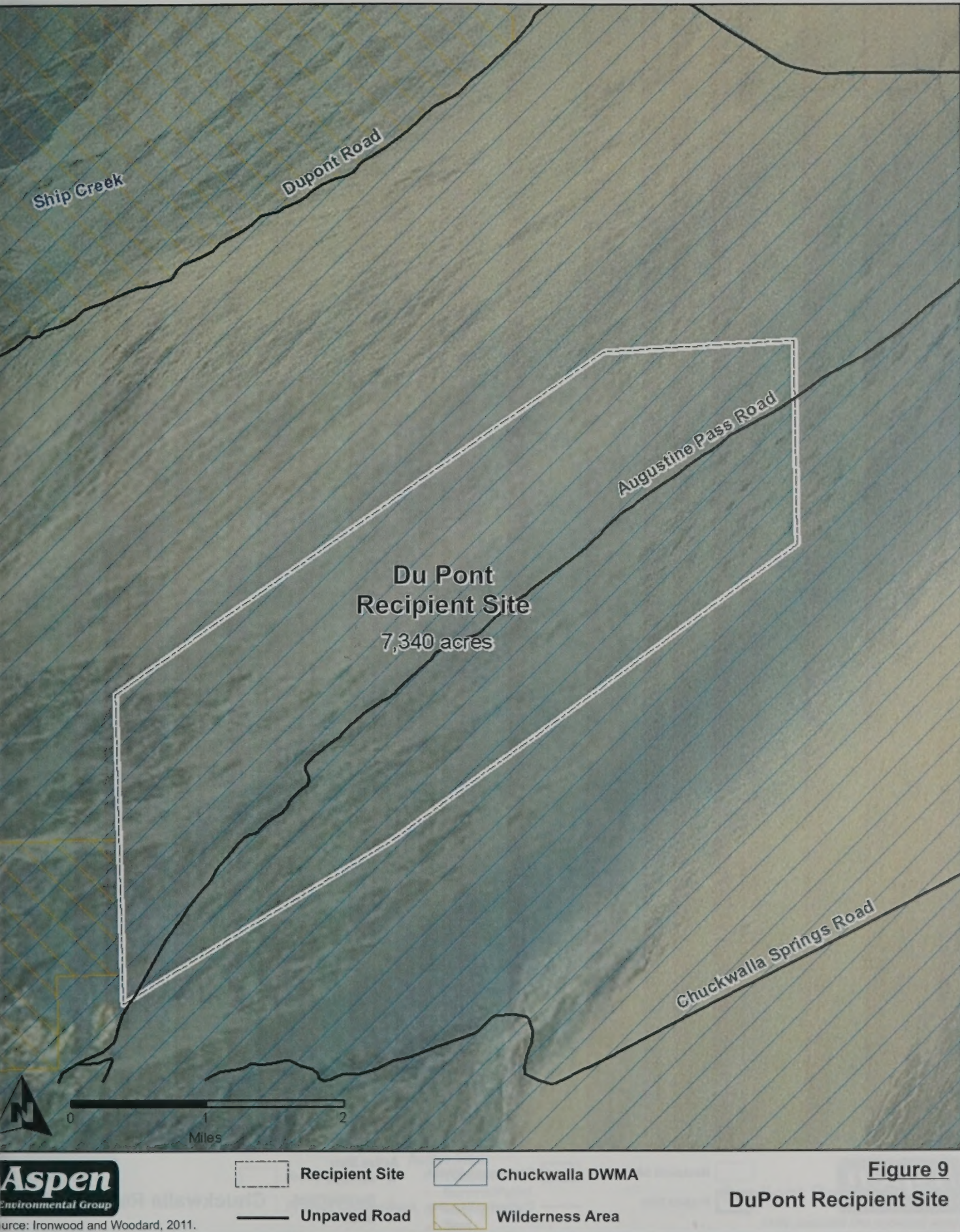


Figure 9
DuPont Recipient Site

Source: Ironwood and Woodard, 2011.

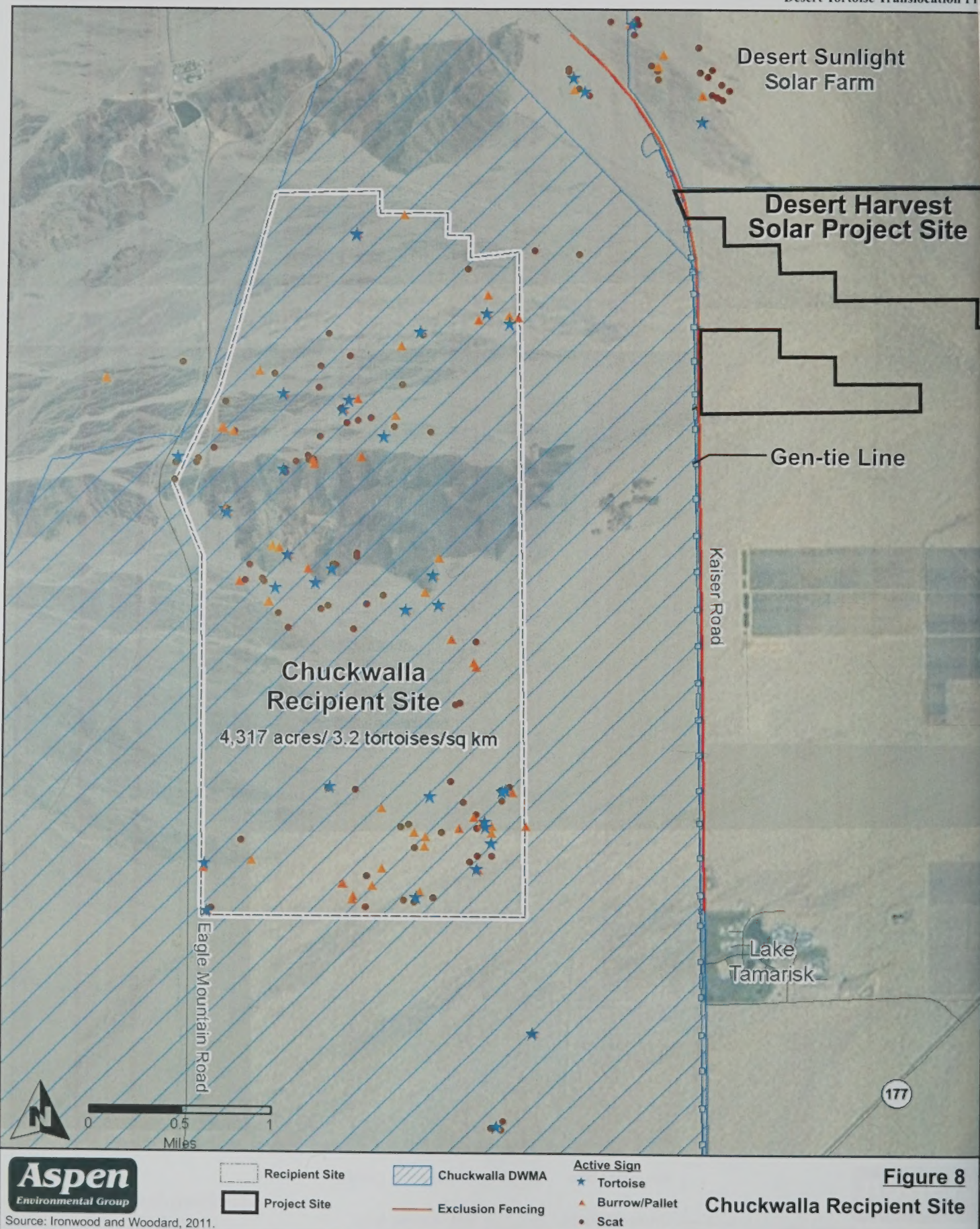
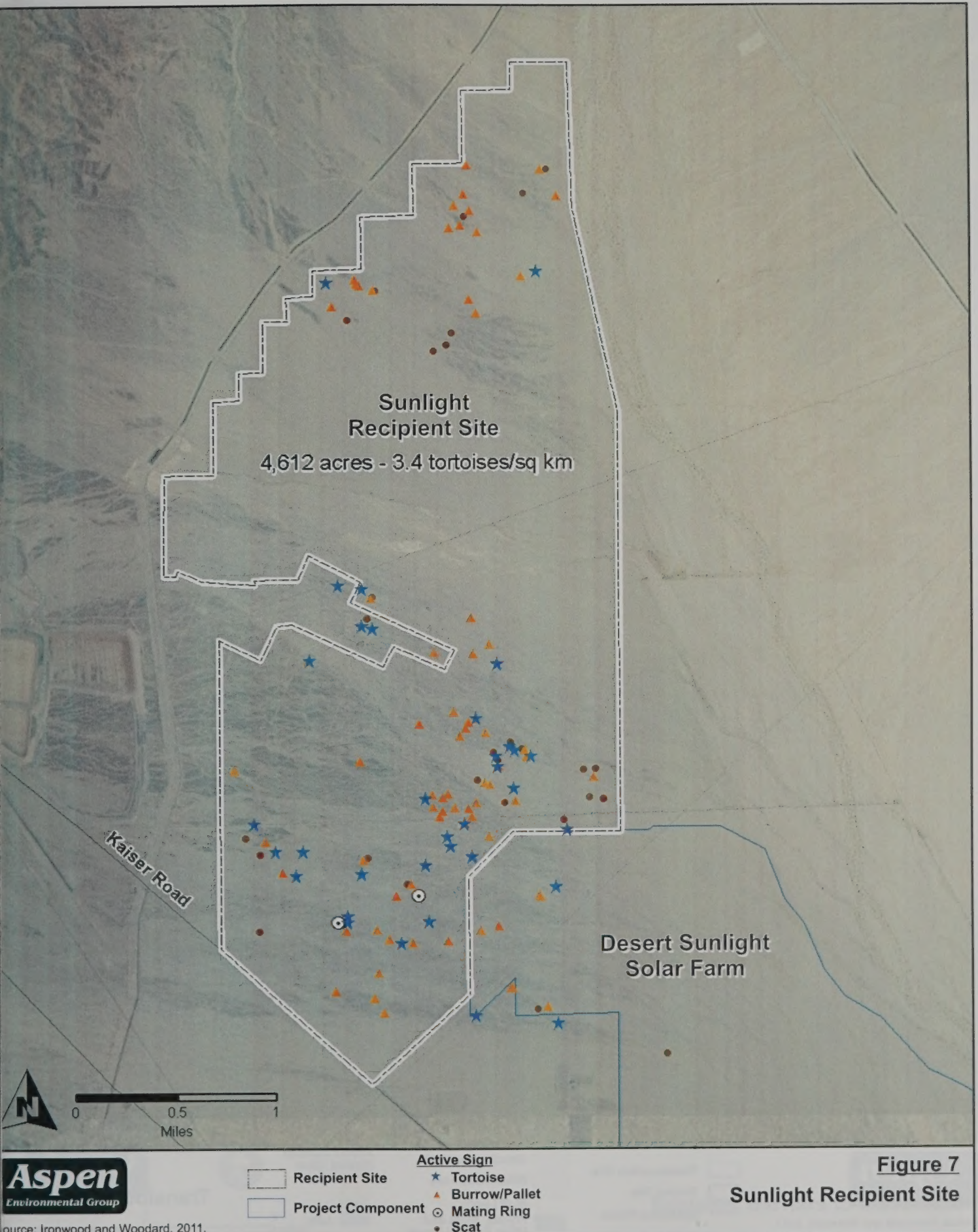


Figure 8

Chuckwalla Recipient Site



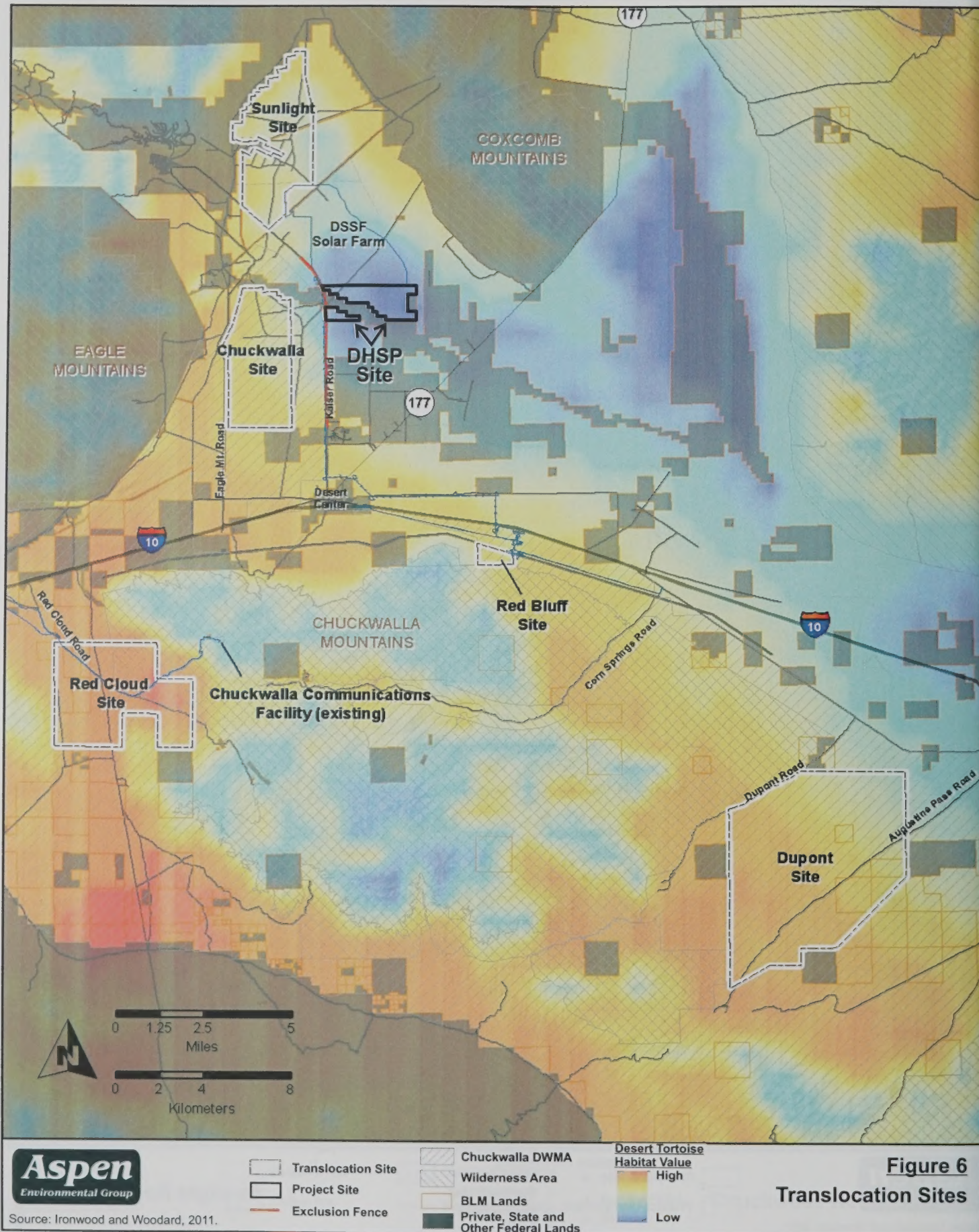


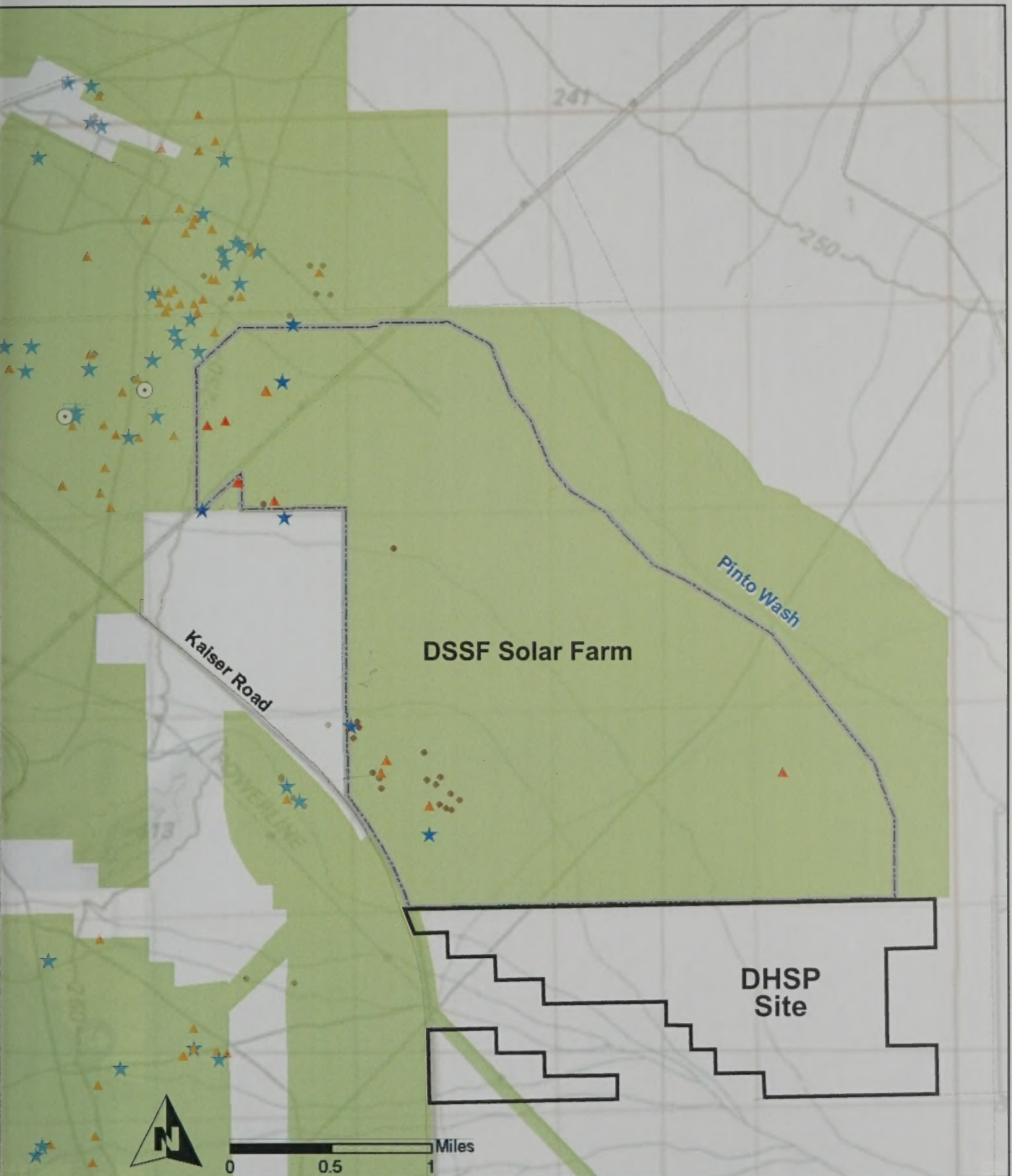
Figure 6
Translocation Sites

Aspen
Environmental Group

Source: Ironwood and Woodard, 2011.









Aspen
Environmental Group



0 1,000 2,000 4,000
Feet

-  Bone Fragments
-  Inactive Burrows
-  Desert Harvest Solar Project

 Gen-Tie Alternative B

Figure 2
Desert Tortoise
Survey Results

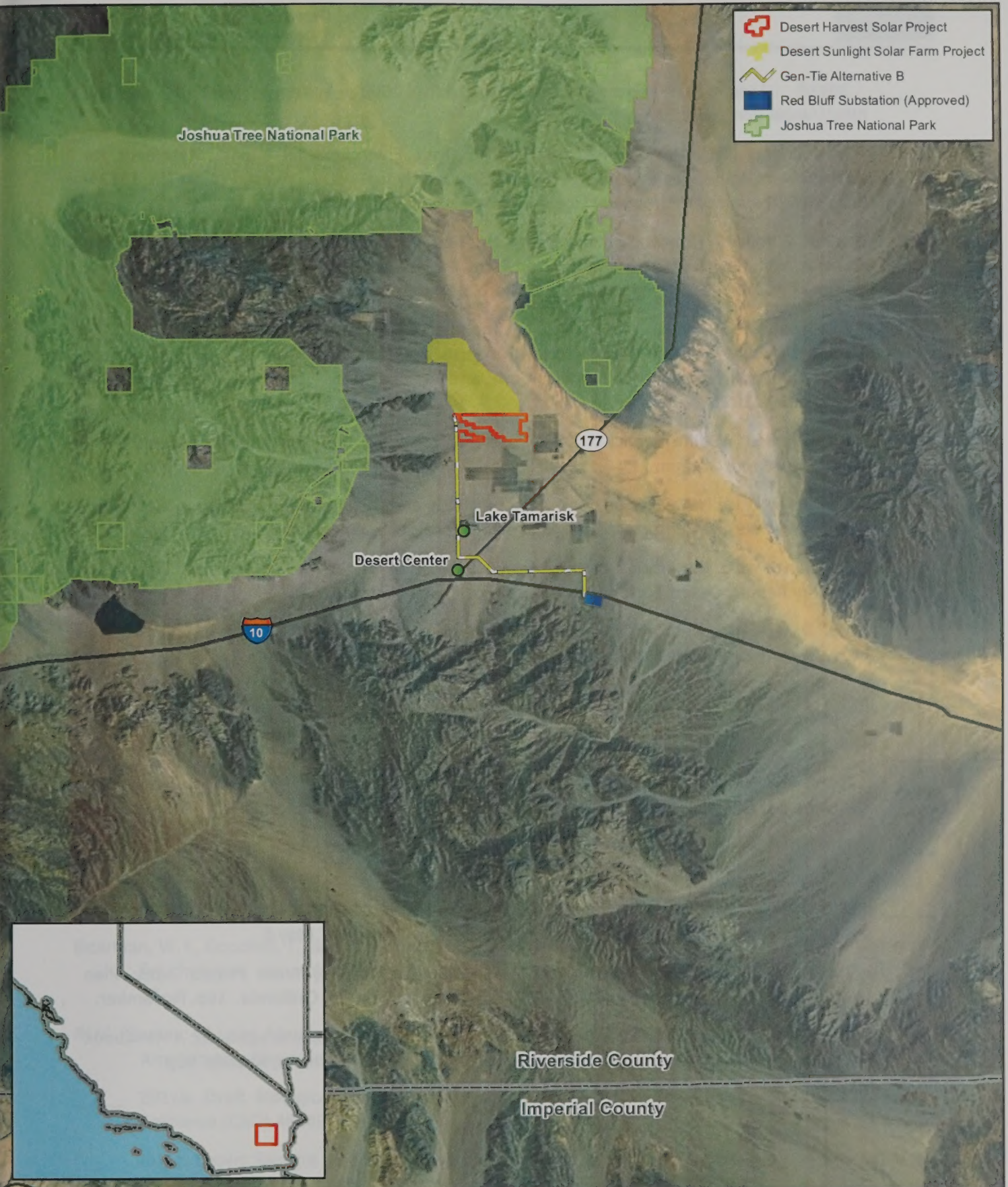


Figure 1

Regional Location

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8.1.2 Biological Monitors

The Applicant and the Designated Biologist shall appoint Biological Monitors as needed for the construction, O&M, and decommissioning phases of the project. During the operations phase, a Biological Monitor may assume most of the on-site duties, so long as a qualified Designated Biologist is available as needed. The Designated Biologist shall submit the resume, at least three (3) references, and contact information of each of the proposed Biological Monitors to the BLM's Authorized Officer, Riverside County, and the Resource Agencies. The resume shall demonstrate, to the satisfaction of the BLM's Authorized Officer and Riverside County, the appropriate education and experience to accomplish the assigned biological resources tasks. The responsibilities, qualifications, and authority of each Biological Monitor will be the equivalent of the USFWS designated Desert Tortoise Monitor (http://www.fws.gov/_information/protocols_guidelines/index.html).

Biological Monitors

TBD

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training and supervising Biological Monitors who conduct desert tortoise surveys, monitor tortoises, or implement any other aspect of this Translocation Plan. The Designated Biologist will be enXco's primary point of contact for BLM, USFWS, and CDFG regarding implementation of this Translocation Plan. The Designated Biologist duties will vary during the construction, O&M, and decommissioning phases. In general, the duties shall include, but shall not be limited to:

- Notify the BLM's Authorized Officer, Riverside County, and the Resource Agencies (USFWS and CDFG) at least 14 calendar days before initiation of ground-disturbing activities.
- Immediately notify the project Owner, BLM's Authorized Officer, Riverside County, and the Resource Agencies (as applicable) in writing of any non-compliance with any of the biological mitigation measures or permit conditions.
- Conduct continuous compliance inspections throughout the initial site preparation activities, including the construction of tortoise-exclusion fencing; pre-construction clearance surveys; and initial clearing, grubbing, and grading. Provide weekly verbal or written updates to BLM, Riverside County, and, for any information pertinent to state or federal permits, to the Wildlife Agencies.
- After the initial clearance and construction activities are complete, conduct monthly compliance inspections throughout the construction and decommissioning phases of the project, and provide weekly verbal or written updates to BLM, Riverside County, and, for any information pertinent to state or federal permits, to the Resource Agencies. Prepare and submit monthly compliance reports as required in **MM VEG-2**, and other reports as required under all applicable mitigation measures. A copy of the monthly compliance reports shall also be provided to the National Park Service (NPS).
- During the operations phase of the project, conduct quarterly compliance inspections; conduct weed monitoring and control (as required in **MM VEG-9**); prepare and submit quarterly compliance reports and other reports as required under all adopted mitigation measures.
- Be available to supervise, conduct, and coordinate mitigation, monitoring, and other biological resources compliance requirements, particularly in areas requiring avoidance or containing sensitive biological resources, such as special-status species or their habitat; and to appoint a Biological Monitor as temporary contact at any time the Designated Biologist will be unavailable.
- Respond directly to inquiries of the BLM, Riverside County, the Resource Agencies, NPS, or any other agencies regarding biological resource issues.
- Train and supervise the Biological Monitors as appropriate, and ensure their familiarity with the Worker Environmental Awareness Program (WEAP) training, mitigation measures, conditions required by biological permits and agreements, and current USFWS guidelines on desert tortoise surveys and handling procedures.
- Maintain the ability to be in regular, direct communication with representatives of the BLM, Riverside County, the Wildlife Agencies, and NPS, including notifying these agencies of dead or injured special-status species.

Designated Biologist

TBD

6. Adaptive Management

enXco will be prepared to modify or amend this Translocation Plan, including methods and locations for translocating desert tortoises, follow-up monitoring, or other components, if necessary and appropriate. Any adaptive management actions will be proposed by the Designated Biologist in response to specific management issues that arise that pose a threat to monitored tortoises, including translocated, recipient, and control site tortoises. Adaptive management strategies will be discussed with BLM, USFWS, and CDFG.

If there are concerns regarding immediate threat to a tortoise, adaptive management decisions (e.g., to relocate a tortoise away from a road) will be made in the field with phone calls or emails to agency personnel made within 72 hours to describe the actions taken to avoid or minimize the threat, as well as any actions recommended to avoid similar threats in the future. If the situation does not pose an immediate threat to one or more tortoises, agencies will be notified of proposed adaptive management decisions for concurrence or additional direction and response from agency personnel before actions are taken.

7. Alternative to Translocation

As an alternative to translocation, the Final DHSP Translocation Plan will identify a strategy to remove desert tortoises on the project site from the wild and place them permanently in facilities approved by USFWS and CDFG, to be fully funded by the project Owner. Current USFWS guidelines (2011c) include a provision that if 5 or fewer tortoises are located on a site, they may be removed from the wild and placed with a USFWS and State-approved program. The only potential program currently known is the Desert Tortoise Conservation Center in Las Vegas Nevada, operated by San Diego Zoo Global. This program is generally considered appropriate only for tortoises deemed inappropriate for translocation (i.e., sick or injured tortoises). Removing healthy tortoises from the wild would avoid risks and adverse impacts of translocation (described in the DHSP DEIS) but also would prevent those animals from contributing to the recovery of wild desert tortoise populations.

8. Roles and Responsibilities and Project Contacts

8.1 Roles and Responsibilities

enXco will appoint a Designated Biologist and one or more Biological Monitors who will be responsible for the implementation of all desert tortoise translocation and monitoring activities. The resumes of the proposed Designated Biologist and Biological Monitors shall be submitted to the BLM, USFWS, and CDFG for approval prior to their appointment on the project. If at any time a personnel change is proposed for these positions, enXco will obtain approval for the new personnel from BLM, USFWS, and CDFG.

8.1.1 Designated Biologist

The Designated Biologist will hold appropriate USFWS and CDFG authorizations to handle desert tortoises, perform visual health assessments, draw blood for disease testing or other clinical purposes, and carry out any other activities related to desert tortoise handling as may be required by this Translocation Plan or by the USFWS or CDFG. The Designated Biologist also will be responsible for

length;

- Dominant (patchy): numerous plants, visually dominant, and covering enough of the ground surface so that the biologist is likely to walk on them along less than half of the transect length;
- Common-abundant (throughout): Found along most of the transect length, but generally spaced widely enough to be easily avoided while walking.
- Common-abundant (patchy): Mostly found in patches, comprising less than half of the transect length, and generally spaced widely enough to be easily avoided while walking.
- Occasional: Scattered along all or part of the transect length, but not difficult to find.
- Scarce: Only one or a few plants seen.

5.3 Reporting

5.3.1 Reporting During Translocation

Within 30 days after completion of desert tortoise clearance surveys and translocation, the Designated Biologist shall submit a Desert Tortoise Clearance Survey, Exclusion Fencing, and Translocation Report to the BLM, Riverside County, USFWS, CDFG, and JTNP describing methods and results of the fencing, clearance surveys, and translocation (if any). The report will also document any other animals relocated during the clearance surveys.

5.3.2 Reporting During Long-Term Monitoring

During the period of long-term monitoring, all information related to translocation and monitoring for the previous calendar year will be compiled by the Designated Biologist and submitted along with all annual report information to the USFWS, CDFG, BLM, and JTNP on or before January 15 for the preceding calendar year. Annual reports will summarize all long-term monitoring activities conducted during the previous calendar year including health assessments, vegetation monitoring, and any adaptive management employed. Each report will include data summary tables and short narrative descriptions of monitoring activities, observations, and (if applicable) notation of any concerns or recommendations.

5.3.3 Final Report

Following the completion of the 30-year monitoring program, a final report will be completed that will assess the overall success of the translocation and monitoring program. The final report will summarize all long-term monitoring activities and will discuss any observed differences in individual or group behaviors in the translocated, recipient, and/or control populations; overall tracking of health assessments for each monitored tortoise; an overview of the 30 years of vegetation monitoring; and any adaptive management employed throughout the long-term monitoring period and an assessment of the success of each adaptive management strategy (see Section 6 below). Copies of the final report shall be submitted to the BLM, CDFG, USFWS, and JTNP.

- A minimum of once a week from March through early November throughout the 30-year monitoring period; and
- Once every 2 weeks from November through February throughout the 30-year monitoring period.

Transmitters will be changed throughout the monitoring period as necessary to maintain battery life. At the end of the 30-year monitoring period, the Designated Biologist will coordinate with BLM, USFWS, and CDFG to determine whether transmitters should be removed and decommissioned.

5.2.1 Health Monitoring

Visual health assessments (Section 4.5) will be conducted twice annually for all monitored tortoises, including translocated, resident, and control site tortoises: once prior to overwintering (i.e., between October 15 and November 15) and once subsequent to overwintering (i.e., between March 1 and April 1). Any health problems (e.g., decline in physical condition, or evidence of disease) or mortalities observed will be reported to BLM, USFWS, and CDFG verbally within 48 hours of discovery and via email within 5 business days thereafter and will include the animal's unique identifier, location, and suspected health issue(s) and/or cause of death (if known). Fresh carcasses will be brought for necropsy as directed by BLM, USFWS, and CDFG.

5.2.2 Vegetation Monitoring

Vegetation will be qualitatively monitored each spring and fall at the recipient and control sites. The Designated Biologist will select a 0.5 km linear transect at each site and record the GPS coordinates at its start and end points. During each spring and fall tortoise activity season, a qualified biologist will walk the transect length and record all plant species observed within an estimated 5 m belt along each side of the transect. These data are intended to provide general, qualitative estimates of vegetation condition, desert tortoise forage availability, and relative abundance of native and non-native species. They are not intended as precise, replicate samples. Minor variations in the transect path or endpoints will be acceptable.

For each shrub species, the biologist will record qualitative indicators of condition as:

- Most plants flowering or fruiting and with new seasonal growth;
- Most plants flowering or fruiting but without new seasonal growth;
- Most plants with new seasonal growth but not flowering or fruiting;
- Most plants in apparently good condition but without flowers, fruits, or new seasonal growth (for drought-deciduous species, most plants with few or no live leaves but without dead branches); or
- Most or many plants evidently stressed, with dead branches (for evergreen species, plants with large numbers of dead leaves or branches).

For herbaceous plants, the biologists will record estimates of total percentage of the ground surface covered by native species and non-native species. For each annual species or perennial herb species, the biologist will qualitatively assign an abundance category, as follows:

- Dominant (throughout): numerous plants, visually dominant, and covering enough of the ground surface so that the biologist is likely to walk on them along most of the transect

decommissioning activities for access roads, gen-tie alignment, drainage channels off the project site, and perimeter security fences or desert tortoise exclusion fences. Clearance surveys and handling of desert tortoises will be in accordance with this Translocation Plan and other project documents, as well as the most recent version of the USFWS's Desert Tortoise Field Manual (USFWS 2009).

Monitoring of the desert tortoise exclusion fence during its construction and the subsequent desert tortoise activity seasons are described above (Section 4.3). Following that period, the exclusion fence will be checked monthly and repaired, as necessary, throughout the construction, O&M, and decommissioning phases, for the life of the project. In addition, it will be checked and repaired during and within 24 hours of any significant rainfall causing visible runoff within channels on the site. Any damage to the fencing will be temporarily repaired immediately to keep desert tortoises out of the project area, and permanently repaired within 48 hours of observing damage. Any time during the life of the project that a tortoise is found walking the fence line, its location and activity will be monitored and the Designated Biologist will contact BLM, CDFG and USFWS to develop a Disposition Plan for the tortoise (Section 4.5).

Project component monitoring results throughout the construction, O&M, and decommissioning phases will be reported according to the requirements adopted in the final EIS, Record of Decision, BO, ITP, and other applicable documents.

5.2 Translocated Desert Tortoises, Recipient Site, and Control Site Monitoring

If 5 or fewer tortoises are translocated from the DHSP site, long-term monitoring of the recipient or control sites will not be required. The remainder of this section will not be applicable.

If more than 5 desert tortoises are translocated from the DHSP site to a designated recipient site, then long-term monitoring at the recipient and control sites will be implemented, as described below. All translocated desert tortoises and an equal number of resident tortoises at the Recipient Site and Control Site will be monitored on a long-term basis for a period of at least 30 years after the initial translocation date, as recommended by USFWS (2011c). The resident and control site tortoises will consist of equal or approximately equal numbers of males and females, regardless of the sex ratio of translocated tortoises (USFWS 2011c).

Monitoring will consist of locating the tortoise and attempting to view it and record its activity, without disturbing it. In some cases, the monitored animal will be handled for visual health assessments or to maintain or replace a transmitter.

The monitoring schedule for translocated tortoises will be:

- Once within 24 hours of release;
- A minimum of twice weekly for the first 2 weeks after release;
- A minimum of once a week from March through early November for the duration of the 30-year monitoring period; and
- Once every 2 weeks from November through February for the duration of the 30-year monitoring period.

The monitoring schedule for resident and control tortoises will be:

meters from their original location. Pre-construction surveys, construction monitoring, and any handling of a tortoise (if needed) will be as follows.

1. Within 30 days prior to construction, a clearance survey will be conducted along each portion of the gen-tie line and all active desert tortoise sign mapped and communicated to the Designated Biologist and site-specific Biological Monitor(s).
2. Biological Monitors shall be on the work site during all construction activities to ensure that active burrows along the gen-tie line will be avoided by project construction activities and facilities.
3. If a desert tortoise is found along the gen-tie line or in any work area associated with the gen-tie line, adverse effects will be avoided by allowing the tortoise to passively traverse the site while construction in the immediate area is halted. If the tortoise does not move out of harm's way after approximately 20 minutes, the Designated Biologist or any other biologist approved by the USFWS, CDFG, and BLM to handle tortoises for the proposed action can actively move the animal out of harm's way within 500 meters of its original location. The Designated Biologist will be responsible for taking appropriate measures to ensure that any desert tortoise moved in this manner is not exposed to temperature extremes which could be harmful to the animal. The Designated Biologist or Biological Monitor(s) will remain at the work site from which the tortoise was relocated for the duration of active construction at that site to ensure the animal does not return.
4. All vehicles parked in desert tortoise habitat will be inspected immediately prior to being moved. If a tortoise is found beneath a vehicle, the Designated Biologist will be contacted to move the animal from harm's way, or the vehicle will not be moved until the desert tortoise leaves of its own accord.

5. Monitoring and Reporting

All activities related to monitoring will be conducted by Designated Biologists identified in the project BO and associated authorizations. Standardized data sheets and/or digital data recorders will be used to record individual tortoise locations, behavior, obvious health indications (not full health assessment but limited assessment of obvious clinical signs), behavior, interactions with other animals, burrow locations, etc. during all monitoring activities.

5.1 Project Component Monitoring for Desert Tortoises: Construction, O&M, and Decommissioning

Mitigation Measure MM-WIL 1 of the Desert Harvest DEIS recommends ongoing monitoring for wildlife, including desert tortoises, during vegetation- or ground-disturbing activities throughout the construction, O&M, and decommissioning phases of the project. If a live tortoise is located during the construction phase (i.e., after the clearance surveys are completed, but before the facility is in operation), the tortoise will be handled as described in this Translocation Plan. All construction activities will temporarily stop until two consecutive full coverage clearance surveys have been repeated throughout the site, without a desert tortoise or new active sign being found.

Monitoring of vegetation- or ground-disturbing activities during O&M or decommissioning phases would also be implemented in areas not enclosed with desert tortoise exclusion fencing, including O&M or

If 5 or fewer tortoises will be translocated, then density estimates, health assessments, and disease testing at the selected recipient site will be arranged in coordination with USFWS, CDFG, and BLM. No health assessments, disease tests, surveys, or monitoring at the Red Cloud Control Site would be required. Portions of this section addressing the control site will not be applicable.

If more than 5 tortoises will be translocated, enXco and the Designated Biologist will commence field surveys to locate desert tortoises for disease testing (if data are not already available) and radio transmitter attachment for long-term monitoring at the selected recipient site and the Red Cloud Control Site.

During the spring or fall desert tortoise activity seasons, following or concurrent with health assessment and disease testing of tortoises at the DHSP site, surveys will be conducted at the selected recipient and control sites to: (1) confirm desert tortoise densities, (2) conduct visual health assessments and collect blood for URTD ELISA tests for all tortoises found at both sites, and (3) attach transmitters to a number of tortoises at both sites equal to the number of tortoises to be translocated. If density and disease status of the resident population at the recipient site are already known, then these new data will not be collected. For each animal handled during these surveys, data collection and identification marking will be as described in Section 4.5.

Disease prevalence at the recipient sites should not exceed 20 percent within the resident population (USFWS 2011a). No animals will be translocated to the selected recipient site until URTD test results for the resident population are available, based on a sample size of resident animals to be determined in coordination with USFWS, CDFG, and BLM.

If more than 10 percent of the resident population at the proposed recipient site test positive for URTD, then the Designated Biologist will contact BLM, USFWS, and CDFG for further guidance or to select an alternative recipient site. Because translocated desert tortoises will disperse from initial release sites, to further reduce the potential for disease transmission, translocated desert tortoises will be placed a minimum distance of 1.5 km (0.9 mi) from any resident desert tortoises that have tested positive for URTD.

Table 1. Translocation of Desert Tortoises and Eggs

Size/Age of Tortoise	Translocation Strategy
Juveniles (<100 g or 120 mm MCL ¹)	Visual health assessment, unique identifier, no transmitter or URTD ELISA test, translocation.
Sub-adults (120-180 mm MCL) and Adults (>180 mm MCL)	Visual health assessment, negative URTD disease test result, unique identifier, transmitter, and translocation.
Nests with potentially viable eggs	If a nest is suspected or found, the eggs will be monitored in place or carefully moved together and placed in a replacement nest created by the Designated Biologist at the recipient site. The replacement nest location(s) will be added to the long-term monitoring program.

1 – midline carapace length

4.7 Linear Project Components

Pre-construction clearance surveys and construction of the gen-tie line may occur at any time of the year (USFWS 2010b). Any desert tortoises found during clearance of linear facilities shall be allowed to leave on their own or moved out of harm's way following clearance and handling procedures outlined in the current *Desert Tortoise Field Manual* (USFWS 2009). Tortoises shall not be moved more than 500

point, and release time, date, and temperature restrictions for each tortoise. Where appropriate, the Disposition Plan will also describe any recipient site pre-release preparation (e.g., construction of artificial burrow) and pre-release animal husbandry activity (e.g., hydration).

Transmitter Attachment. If more than 5 adult and subadult tortoises will be translocated, then each one will be fitted with a radio transmitter for long-term monitoring. Transmitters will not be attached to juvenile tortoises (weighing less than 100 g or measuring less than 120 midline carapace length) unless the transmitters weigh less than 10% of the tortoise's body weight. If 5 or fewer adult and subadult tortoises will be translocated, then enXco will not be responsible for further monitoring. If radio transmitters are already in place, the transmitters may be removed, or (at the direction of BLM, USFWS, and CDFG) left in place to allow follow-up monitoring by the agencies.

Each tortoise larger than 120 mm carapace length will be assigned a unique identifier and fitted with a transmitter following methods, including handling and temperature restrictions, provided in *Review of Radio Transmitter Attachment Techniques for Chelonian Research and Recommendations for Improvement* (Boarman et al. 1998) and the most recent USFWS translocation guidance. Transmitter attachment will conform to restrictions of time of day, temperature, and total time handled (USFWS guidance provided at recent health and disease workshops and *Desert Tortoise Field Manual*, USFWS 2009). Transmitters will be replaced as necessary throughout the monitoring period (Section 5.2).

Translocation. Desert tortoises will be translocated during their spring activity periods (April 1 through May 31), well enough in advance of the summer inactive period to enable each tortoise to acclimate to the recipient site and to locate or build a suitable burrow. Release dates will be proposed in each Disposition Plan, to be reviewed and approved by the USFWS, CDFG, and BLM.

Each desert tortoise to be translocated will be visually evaluated for health and condition immediately prior to translocation. Tortoises previously considered suitable for translocation but subsequently showing clinical signs of URTD or other illness or injury will be held pending further evaluation. Healthy-appearing tortoises will be hydrated according to the most current agency guidance or protocols. They will be transported to release sites as specified in the Disposition Plans in clean, ventilated protective containers. The containers will be disinfected prior to any re-use. Tortoises will be released at unoccupied shelter sites such as burrows, spaces within rock outcrops, caliche caves, or the shade of shrubs or trees.

All translocations will take place between 0700 and 1600 hours (7:00 AM and 4:00 PM), and while air temperature is between 18° and 30°C (65-85°F). Temperatures will be taken at approximately 2 inches above ground in a shaded area. Tortoises will only be released if temperatures are not forecast to exceed 32°C (90°F) within 3 hours of release and if daily low temperatures are not forecast to be cooler than 10°C (50°F) for one week following the release date. Release locations will be identified and spatial patterns among tortoises will be maintained as consistently as possible to those found on the DHSP site. Tortoises found in close proximity to each other on the DHSP site will be released in the same area in the same proximity.

4.6 Surveys and Disease Testing at Recipient and Control Sites

If 1 or more tortoises will be translocated from the DHSP site, enXco will coordinate with USFWS, CDFG, and BLM to determine the most appropriate recipient site and need for additional density estimates, health assessments, and disease testing at the selected recipient site or control site.

shelter site. The last date for blood sampling will be October 31. In order to minimize handling on any given day, blood drawing and transmitter attachment (below) will only be done on the same day if these activities combined will not exceed restrictions of time of day, temperature, and total time handled (USFWS guidance provided at recent health and disease workshops and *Desert Tortoise Field Manual*, USFWS 2009). If these restrictions could be exceeded, then the two activities will be done on separate days.

Tortoises with positive URTD test results will be held in quarantine enclosures (below) on the project site, pending preparation and approval of a Disposition Plan and relocation to the Desert Tortoise Conservation Center in Nevada or other offsite location. If test results are inconclusive, the animal will be held in a quarantine enclosure until results of a second test are available.

Quarantine Enclosure: Tortoises showing visual evidence of illness or injury, or testing positive or inconclusive for URTD will be held in quarantine enclosures on the site, pending transport to the Desert Tortoise Conservation Center (DTCC) in Nevada, or (for inconclusive disease tests) results of repeated tests. The specific locations of the enclosures will be determined by the Designated Biologist prior to initiation of preconstruction clearance surveys, in consultation with BLM, USFWS, and CDFG. The Designated Biologist may recommend holding them at an alternate offsite facility, pending approval of the BLM, USFWS, and CDFG. The enclosure design and the care of tortoises held in them will follow protocols described by San Diego Zoo Global (*Temporary Captive Care of Wild Mojave Desert Tortoises: Examples of Protocols Used at the Desert Tortoise Conservation Center*, Appendix 1 to USFWS 2011c) or the most recent USFWS translocation guidance. The enclosures will be at least 20 m × 20 m (65.6 ft × 65.6 ft). Husbandry of the quarantined animals, including aseptic techniques and site security from predators and humans; and provision of burrows, food, and water will conform to recommendations of San Diego Zoo Global (cited above). Quarantined tortoises will be monitored in accordance with surveillance recommendations of San Diego Zoo Global. The quarantine period will not exceed 18 months. Every attempt will be made to translocate or transport to the DTCC each animal within 18 months of the date it was initially discovered.

Disposition Plan. The Designated Biologist will recommend a Disposition Plan for each tortoise and submit the plans to the USFWS, BLM, and CDFG for concurrence prior to moving any desert tortoises. Each Disposition Plan will include the visual health assessment and URTD test results. Desert tortoises will not be taken off the project site prior to concurrence by the BLM, USFWS, and CDFG with the Disposition Plan.

If a desert tortoise is determined to be sick or injured, BLM, USFWS, and CDFG will be notified within 24 hours of such discovery. The Designated Biologist will generally recommend transport to the Desert Tortoise Conservation Center. In some cases (e.g., minor injuries) the Designated Biologist may recommend observation for possible future translocation in the wild. If a tortoise is transported outside the State of California it will only be with CDFG's prior written consent. The Applicant shall submit to CDFG a written request indicating the number of desert tortoises to be relocated out of state, the reason for relocating them (i.e., the nature of the disease or injury), the proposed facility to which the desert tortoise(s) will be relocated, and the date on which they are proposed to be relocated. CDFG will provide a written response to each such request indicating, on a case-by-case basis, whether the relocation is authorized.

Tortoises that are suitable for translocation (i.e., tortoises without visual evidence of illness or injury and testing negative for URTD) will be held on the site pending authorization from BLM, USFWS, and CDFG, and until the appropriate date for translocation. The Disposition Plan will specify a recipient site, release

mesh) that will permit hatchlings to escape but prevent depredation by canids that might be attracted to the new nests by human scent. Open-mesh fencing or avian netting also will be installed on the roof to prevent predator entry. The replacement nest location(s) will be added to the long-term monitoring program.

If hatchling or juvenile desert tortoises measuring less than 120 mm midline carapace length or weighing less than 100 grams (i.e., too small for marking, radio transmitters, or blood collection) are located during clearance surveys, they will be carefully collected from the field and maintained in disinfected, separate containers either indoors or in on-site quarantine enclosures, depending on season, temperatures, and anticipated holding time. The Designated Biologist will contact the USFWS, CDFG, and BLM to determine the best course of action.

Visual Health Assessment. Visual health assessments will be conducted by biologists approved and permitted by the BLM, USFWS, and CDFG to conduct such assessments, following USFWS guidance (2011c). Visual health assessments will be performed upon locating tortoises during pre-construction field surveys; prior to translocation; and if more than 5 tortoises are translocated, repeated periodically during long-term monitoring (Section 5.2). At a minimum, for all desert tortoises handled, the Authorized Biologist will mark the animals with unique identification numbers as assigned by the USFWS and record data as recommended by the USFWS (2011c; 2011d), including:

- Locations (narrative and maps) and dates of observation;
- General condition and health, including injuries, state of healing and whether desert tortoise voided its bladder during handling;
- Locations the tortoise is moved from and moved to (GPS coordinates);
- Gender, midline carapace (shell) length, weight, and diagnostic markings (i.e., identification numbers or marked lateral scutes [shell segments]);
- Ambient temperature when handled and released; and
- Digital photograph of each desert tortoise handled.

Tortoises showing evidence of injury or illness will be held in quarantine enclosures (below) on the project site, pending preparation and approval of a Disposition Plan and relocation to the Desert Tortoise Conservation Center in Nevada or other offsite location. Tortoises appearing healthy will be held on the site for disease testing and disposition.

Holding *in situ*. Healthy appearing tortoises will be held on the project site until blood is drawn, test results are received and Disposition Plans (below) are prepared by the Authorized Biologist and approved by USFWS and CDFG. The tortoises will either be (1) fitted with a radio transmitter (below) and allowed to move throughout all or part of the project area (i.e., within the tortoise exclusion fence and away from any project construction area); or (2) held within a fenced 100 m radius (8 acre) area surrounding the active or occupied burrow to enable subsequent relocation. No tortoise will be held on the site for longer than 18 months.

Disease Testing. All tortoises larger than 120 mm median carapace length or weighing more than 100 grams (3.5 ounces) and showing no apparent illness or injury will be tested for URTD using an enzyme-linked immunoabsorbent assay (ELISA) test and held on the site pending test results. Because physiological activity of the tortoise immune system is related to behavioral activity, blood samples will be drawn no earlier than May 15 or, upon specific approval from USFWS and CDFG, four weeks after the date that the tortoise left its hibernaculum or was first found active and above ground away from a

4.5 Desert Tortoise Handling and Disposition

Desert tortoises will only be handled by biologists who are authorized by the USFWS and CDFG to do so (i.e., the project's Designated Biologist and any Biological Monitor with appropriate qualifications), and any handling of desert tortoises will follow specific terms of agency permits or MOUs, including daily, seasonal, and air or ground temperature limitations on handling (USFWS 2009). All adult or subadult tortoises located during preconstruction surveys for the exclusion fence or project construction, or located during follow-up monitoring, will be visually assessed for sign or injury or illness; blood will be drawn for URTD testing (from individuals that do not show clinical signs of disease); and held on the project site pending test results and a Disposition Plan.

Temperature Considerations. Desert tortoises will only be captured, moved, transported, released, or evicted from their burrows when the ambient air temperature ranges from 18-30°C (65-85°F) and is not forecast to exceed 32°C (90°F) within 3 hours of release or 35° (95°F) within 1 week of release. Ambient air temperature will be measured in the shade created by the observer, protected from wind, at a height of 2 inches (5 cm) above the ground surface. Deviation from these temperature thresholds may be considered in coordination with the Resource Agencies.

Inactive Desert Tortoises. Pre-construction clearance surveys will be conducted during the spring or fall desert tortoise activity seasons (approximately April 1 to May 31 and September 1 to October 15), and any tortoises found during these surveys would likely be active. However, it is possible that one or more tortoises may be located outside or near the end of the activity season (i.e., during pre-construction fence alignment surveys). Additionally, a tortoise may display minimal activity by remaining near a burrow entrance, even during the general activity season. In these cases, the tortoise may be left in place until the next activity season or, if needed to avoid injury, may be "blocked" into an artificial burrow on the project site during winter inactivity season, but not during summer (USFWS 2009; 2011c). Inactive tortoises found within the fence alignment or within 50 m of it will be moved out of harm's way into an artificial or empty natural burrow, inside of the perimeter fence (i.e., onto the DHSP site), and monitored. Depending on season and temperature considerations, the tortoise may be blocked into the burrow, or a temporary desert tortoise exclusion fence may be built at a 100 m radius surrounding the burrow (enclosing the inactive tortoise within an 8 acre area). If a tortoise within a burrow must be moved, every effort will be made to cause it to leave the burrow on its own (e.g., pounding the ground, "tapping," or repeated visits to the burrow at warmer or cooler times of day) prior to using the less-preferred method of carefully excavating the burrow by hand (USFWS 2009).

Tortoises confined in burrows or within 100 m radius enclosures, will be monitored for activity and safety daily for at least 1 week; then weekly for at least 3 weeks; then twice monthly until either translocation or transfer to a quarantine enclosure.

Eggs, Hatchlings, or Juvenile Tortoises. If a clutch of eggs is located during pre-construction clearance surveys, the location will be recorded and the nest will be monitored daily from a distance, using binoculars, to prevent the possibility of identifying the nest to avian or canid predators. The Designated Biologist will contact the USFWS, CDFG, and BLM to determine the best course of action, depending on date, vulnerability to predation, and construction schedule. The eggs may be left in place to hatch, or may be collected and translocated. If the eggs do not hatch in place, they will be inspected to determine if they are viable. If so, the Designated Biologist or another USFWS Authorized Biologist will translocate them to a replacement nest in a comparable micro-area (e.g., cover, project species, soil type, substrate, and aspect) at the recipient site, in accordance to the USFWS Desert Tortoise Field Manual (USFWS 2009). Translocated nests will be fenced with sturdy open-mesh fencing (e.g. 2-inch wide chain link

During fence construction, the Designated Biologist or Biological Monitor will be on site during all construction activities. They will be responsible for surveying work areas for tortoises or sign, and ensuring compliance with the project Worker Environmental Awareness Program (WEAP).

It is possible that the exclusion fence may cross the home range of a desert tortoise, preventing it from accessing part of its normal range. The exclusion fence will be monitored twice daily during fence construction and for 7 days following completion of its construction to locate any tortoise that may be pacing the fence. Thereafter, the exclusion fence will be inspected daily throughout desert tortoise spring and fall activity seasons (approximately April 1 to May 31 and September 1 to October 15) for one year after fence completion. Outside of tortoise activity seasons, and for the remainder of the life of the project, the fence will be inspected monthly and maintained as needed. Any damage to the fence that could allow a tortoise to enter the site will be repaired promptly. The fence will also be inspected during and within 24 hours following any significant rainfall event (defined as any rain storm causing measurable flow in channels or washes crossing the fence line) to ensure that storms have not damaged the fence, potentially allowing access by desert tortoises. Any damage to the fence shall be temporarily repaired immediately and permanently repaired within 48 hours. If a tortoise is found walking the fence line outside the project area, its location and activity will be monitored and the Designated Biologist will contact BLM, CDFG and USFWS to develop a Disposition Plan for the tortoise (Section 4.5).

4.4 Pre-Construction Clearance Surveys

Pre-construction desert tortoise clearance surveys will be completed throughout the fenced project area, during the spring or fall desert tortoise activity season (approximately April 1 through May 31 or September 1 through October 15). Survey transects will be no wider than 15 feet and will conform to pre-construction clearance survey methods described by the USFWS (2009). If the project area is subdivided into fenced subsections for construction phasing, then pre-construction clearance surveys will be completed and all tortoises removed from any subsection prior to initiation of pre-construction site preparation, or any construction-related activities. Clearance survey transects will be spaced at maximum widths of 15 feet. The transects will be paced slowly enough so that biologists may thoroughly view any areas partially hidden by rocks or shrubs, to ensure that all tortoises on the site are found. Any tortoises found during pre-construction surveys will be handled as described below (Section 4.5).

The entire fenced ROW area (or each fenced subsection) will be surveyed repeatedly to ensure that any tortoise within the area is located and removed prior to construction or site preparation. If one or more tortoises are located during a 100 percent coverage pass, then the entire area will be covered at least twice more. Surveys will be repeated until two consecutive 100 percent coverage passes of the site are completed without finding a tortoise or any sign of recent tortoise activity (e.g., scat or burrow) other than sign located during previous transects. Each successive full coverage pass will follow transect lines perpendicular to the previous pass (e.g., full coverage on north-south transects, then on east-west transects).

During clearance surveys all desert tortoise burrows, and all burrows constructed by other species that might be used by desert tortoises, will be examined by the Authorized Biologist and Biological Monitor(s) to assess occupancy of each burrow by desert tortoises. All potential desert tortoise burrows located during clearance surveys during the active season will be excavated carefully by hand; if desert tortoise occupancy is confirmed, excavation of the burrow and handling of tortoises will be conducted in accordance with this Translocation Plan and the most recent version of the USFWS's Desert Tortoise Field Manual (USFWS 2009). To prevent reentry by a desert tortoise or other wildlife, all burrows will be collapsed once absence has been verified.

4.2 Designated Biologist and Biological Monitors

Prior to initiation of any ground-disturbing activity, including installation of tortoise exclusion fencing, enXco will appoint a Designated Biologist and one or more Biological Monitors, as described in Mitigation Measure VEG-1 of the DHSP DEIS and Section 8 of this Translocation Plan. The Designated Biologist will hold appropriate USFWS and CDFG authorizations to handle desert tortoises, perform visual health assessments, draw blood for disease testing or other clinical purposes, and carry out any other activities related to desert tortoise handling as may be required by the USFWS or CDFG. The Designated Biologist also will be responsible for training and supervising Biological Monitors who conduct desert tortoise surveys, monitor tortoises, or implement any other aspect of this Translocation Plan. The Designated Biologist will be enXco's primary point of contact for BLM, USFWS, and CDFG regarding implementation of this Translocation Plan.

4.3 Tortoise Exclusion Fence

Tortoise exclusion fencing will be constructed around the perimeter of the DHSP site prior to desert tortoise clearance surveys, pre-construction site preparation, or any construction-related activities. enXco will coordinate with DSSF to determine whether DHSP may share the existing exclusion fence on the shared boundary between the two project sites, or if a separate fence must be constructed. If a separate fence is built on the shared boundary, enXco will build tortoise exclusion fencing across any opening at the east and west ends of the shared boundary to prevent desert tortoises or other wildlife from entering any narrow passageway between the two fences, where they would likely become entrapped. Upon completion of desert tortoise exclusion fencing around both project sites and pre-construction clearance surveys within each site, the shared boundary fence will no longer serve to exclude desert tortoises from either project area, and need not meet design requirements for tortoise exclusion fencing. With this exception, fences will be constructed and maintained according to USFWS (2005) specifications. enXco may also construct one or more temporary tortoise exclusion fences within the interior of the project site to allow for phased project construction in part of the ROW while tortoises are held in situ on the remainder of the site.

Fence construction may take place during any season. Construction disturbance for fence installation will be limited to 15 feet on either side of the fence centerline. The limits of disturbance for fence construction will be staked on the ground and enXco shall provide a figure for USFWS, CDFG, and BLM review clearly depicting the limits of construction disturbance for the proposed fence installation at least 30 days prior to any ground disturbance. No more than 10 days prior to fence construction, the fence line and an adjacent buffer 30 feet wide on either side of the centerline will be surveyed for desert tortoises and sign. Survey transects for fence construction will be no wider than 15 feet and will conform to pre-construction clearance survey methods described by the USFWS (2009). If the disturbance area for all or part of the fence construction activities must be wider than 15 feet on either side of the centerline, then pre-construction surveys will extend at least 15 feet beyond the limits of disturbance. Pre-construction surveys will be carried out by the Designated Biologist and one or more Biological Monitors, under the Designated Biologist's supervision.

Any active tortoises found above ground on the fence alignment or adjacent buffer area (including the surveyed area described above and any incidental tortoise observations up to 50 m beyond the fence line) during the preconstruction clearance survey or during construction will be placed inside the DHSP site and handled as described in Section 4.5, below. Their locations will be monitored during fence construction to ensure that they do not leave the project area.

location. The translocation activities described below will be revised as needed to comply with the terms and conditions contained in the BO and the ITP or Consistency Determination upon issuance by the USFWS and CDFG.

Any desert tortoises that are found on the DHSP site during pre-construction clearance surveys will be either translocated to a recipient site or removed from the wild, depending upon disease status and resource agency direction. The survey, testing, and translocation procedures are briefly summarized here as an overview. First, the DHSP site will be fenced to prevent desert tortoises from entering it throughout the life of the project. Second, all desert tortoises within the fenced boundaries will be located by field biologists and their health conditions will be assessed visually. For tortoises that appear healthy, blood will be drawn to determine URTD status, and they will be allowed to move about all or part of the fenced project site, pending results of the disease test. Depending on their activities, they may be fitted with radio transmitters, or they may be monitored visually, by regularly confirming their locations, until they are removed from the site. Tortoises showing visual signs of illness or injury will be held in quarantine facilities on the site to prevent them from interacting with other tortoises, until they are removed from the site for transport to a suitable care facility.

Vegetation clearing, grading, and construction of the DHSP may proceed in phases. These activities will not take place in any given portion of the project site until all tortoises throughout the project site have been either translocated off the site or held in fenced areas or quarantine enclosures elsewhere on the project site pending translocation or transport to a care facility. Holding areas will be away from work areas, and protected by exclusion fencing so that tortoises cannot access the work areas.

Blood samples will be sent to a laboratory for disease assay. No tortoises will be translocated from the site until the test results are returned. Depending upon the results of the visual health assessment and laboratory disease test, tortoises may be translocated to the selected recipient site or may be removed from the wild. After all pre-construction clearance surveys and visual health evaluations are complete, the Designated Biologist and Resource Agencies (USFWS and CDFG) will tentatively determine the number of tortoises to be removed from the site, and will prepare a Disposition Plan for each tortoise. Depending on the numbers of healthy and diseased or injured tortoises, translocation activities will proceed as follows:

- If the total number of tortoises to be removed from the site (including healthy animals and any sick or injured ones) is 5 or fewer, then a mitigation fee may be assessed in lieu of translocating and monitoring these tortoises (USFWS 2011c). This option is consistent with Mitigation Measure MM-WIL-2 of the DHSP DEIS (see Section 7, below).
- If the total number of tortoises to be removed from the site (including healthy animals and any sick or injured ones) is 5 or fewer, then a mitigation fee may be assessed in lieu of translocating and monitoring these tortoises (USFWS 2011c). This option would be consistent with the terms of the DHSP EIS (see Section 7, below).
- If more than 5 tortoises will be translocated to a recipient site (excluding diseased or injured tortoises to be removed from the wild), then field work at the recipient and control sites will be initiated to locate an equivalent number of tortoises at each site to be fitted with transmitters for monitoring, and to evaluate disease status of the recipient site population (USFWS 2011c). The monitoring plan (Section 5) will be implemented.
- Any injured or diseased tortoises that are removed from the wild will be transferred to the Desert Tortoise Conservation Center in Las Vegas, Nevada or an alternate facility to be determined in consultation with Resource Agencies.

3.4 Control Site

If more than 5 desert tortoises are translocated from the DHSP site, then an equivalent number of tortoises will be monitored at a control site to allow comparison of desert tortoise movement and behavior among the translocated animals, recipient population, and control population. The USFWS (2011c) states that potential control sites should:

- be similar in habitat type/quality, desert tortoise population size/structure, and disease status to the recipient sites;
- not have been previously used as a recipient site for other projects; and
- be a minimum distance of 10 km (6 miles) from an unfenced recipient site that has no substantial anthropogenic or natural barriers to prevent the interaction of control, resident, and translocated desert tortoises.

The proposed Red Cloud Control Site is located approximately 7 miles southwest of Desert Center, south of I-10 (Figure 6). Desert tortoise surveys of this site have not been conducted, but available data suggests that this site has the potential to support moderate to high densities of desert tortoise (Nussear 2009; USFWS 2006; Ironwood and Woodard 2011).

- Similar habitat to the recipient site. The proposed Red Cloud Control Site is located southwest of the Sunlight and Chuckwalla Recipient Sites and northwest of the DuPont Recipient Site. The proposed control site is comprised of intact creosote bush scrub with active alluvial fans with friable soils and prominent washes supporting desert dry wash woodland, similar to the habitats found on the project and recipient sites.
- Not previously used as a recipient site. The Red Cloud Control Site has not been previously used as a recipient site for other projects.
- Minimum distance of 10 km (6 miles) from the recipient site or have fencing or other movement barrier between sites. No portion of the Red Cloud Control Site is within 10 km (6 miles) of proposed recipient sites. In addition, there are several existing barriers to movement between the sites, including I-10 and the Chuckwalla Mountains.

4. Methods for Desert Tortoise Translocation

4.1 Overview

For projects necessitating translocation of more than 5 desert tortoises to recipient sites, the USFWS generally requires long-term monitoring of the translocated tortoises, as well as similar monitoring of resident tortoises at the recipient site and a control site. enXco anticipates that fewer than 5 desert tortoises, and possibly none at all, will be translocated for the project, and that long-term monitoring will not be necessary. However, this Translocation Plan identifies a control site and describes a monitoring plan for translocated tortoises and resident tortoises within the recipient and control sites for implementation if more than 5 tortoises are translocated. Any tortoises translocated from the DHSP site would be translocated more than 500 meters. The translocation process described in this section will apply only to tortoises found on the DHSP site or immediately adjacent to it (i.e., on the fence line). Any tortoise encountered in a work area along the gen-tie line would be allowed to leave the site on its own, or if necessary, would be relocated out of harm's way, no more than 500 meters from its original

The vegetation is similar to those found on the DHSP site. Habitats on the DuPont Recipient Site support all life stages of the desert tortoise (USFWS 2011b).

2. *Disease prevalence. Data on disease prevalence in the resident population are not available. These data would be collected upon issuance of a Biological Opinion from the USFWS and Consistency Determination or ITP from CDFG.
3. *Minimum 10-km distance from major unfenced roads or highways. The closest major unfenced road or highway to the DuPont Recipient Site is I-10, approximately 5.0 km (3.1 miles) north. In order for the site to meet this selection criterion, desert tortoise exclusion fencing would be necessary along I-10 north of the site.
4. Within 40 km of the project site, with no natural barriers to movement between them. The DuPont Recipient Site is approximately 32 km (20 miles) southeast of the DHSP site. There are no natural barriers that would have limited gene flow between the sites. I-10 is now a significant anthropogenic barrier between the sites.
5. Resident desert tortoise population depletion. Desert tortoise densities at the DuPont Recipient Site are unknown.
6. Detrimental ROWs or other encumbrances. There are no existing designated ROWs or other encumbrances that would conflict with desert tortoise habitat suitability within the DuPont Recipient Site.
7. Conservation management. The DuPont Recipient Site is located primarily on BLM-managed lands within the Colorado Desert Recovery Unit and the Chuckwalla DWMA and CHU for desert tortoise. One 259 ha (640 acre) inholding within the DuPont Recipient Site is owned and managed by the State of California. No tortoises would be translocated to this parcel, although they would be likely to use habitat resources there following the translocation.

The DuPont Recipient Site is 32 km from the DHSP site, and on the south side of I-10, well outside potential home ranges of any tortoises that may be on the DHSP site. Desert tortoises have been observed in the DuPont Recipient Site, but field survey data are not available and desert tortoise densities are unknown. US Geological Survey (USGS) modeling (Figure 6) suggests moderate to high habitat potential. Range-wide sampling between 2001 and 2005 within the region indicated the historical presence of tortoise (i.e., carcasses) and recorded one live tortoise in 2003 (USFWS 2006, as cited in Ironwood and Woodard 2011). In September 2010, random transects were walked throughout the site to assess general habitat characteristics and habitat suitability for desert tortoise. These surveys covered approximately 20 linear miles and recorded no sign of active desert tortoise or any older sign (e.g., inactive burrows, old scat, or carcasses) (Ironwood and Woodard 2011). There are no known significant subsidies for canid or avian predators (e.g., human activity, trash dumping) and no anticipated new sources of subsidies related to new land use proposals.

Access to the area is available via unpaved roads, with travel time between the DHSP site and recipient site more than 60 minutes.

The USFWS (2011a) estimated that approximately 111 subadult and adult resident desert tortoises may be present at the DuPont Recipient Site, based on the density estimate of 3.7 tortoises/km² in the Chuckwalla CHU and DWMA.

portion of the DHSP site. There are no significant natural barriers to movement on or adjacent to the Chuckwalla Recipient Site. The Chuckwalla Recipient Site is within a potential connectivity corridor extending from the Pinto Basin and JTNP, southward through upper Chuckwalla Valley and south beyond I-10.

The use of the Chuckwalla Recipient Site would be contingent upon several conditions relating to its proximity to roads and a potential future gen-tie ROW. The site is less than 10 km from Interstate 10. In order to meet the USFWS required criterion 3 (above), the north side of I-10 would need to be fenced to exclude tortoises along approximately 20 km of its length. Fencing on Kaiser Road may also be necessary, depending on traffic volume during construction and operation of the DHSP, DSSF, and possibly EMPSP. In addition, the EMPSP gen-tie alignment along Eagle Mountain Road may degrade habitat suitability or increase raven activity (due to perch or nest site “subsidies” on the gen-tie towers within the Chuckwalla DWMA, including the recipient site. (Note that FERC staff’s recommended alignment would not be within the Chuckwalla DWMA). The Chuckwalla Recipient Site is also near the proposed DHSP/DSSF gen-tie alignment along Kaiser Road; and the project gen-tie also may serve as raven perch or nest subsidies.

If desert tortoises are translocated into the Chuckwalla Recipient Site, the preferred release point would be in the northern part of the recipient site, north of the unnamed hills approximately 1 km west of Kaiser Road, because it is furthest from I-10 and Desert Center. The intervening hills may minimize tortoise movement toward I-10.

Ironwood and Woodard (2011) noted that coyote and kit fox sign were highest in the southwest part of the Chuckwalla Recipient Site. The community of Desert Center may be a source of predator subsidies (food and water) to both species, as well as feral dogs. Utilization of the northern release point described above may reduce vulnerability to predation for translocated desert tortoises. In addition, the DHSP and DSSF gen-tie line will be subject to Raven Management Plans to be implemented for both projects, which would reduce vulnerability to predation by ravens.

Kaiser Road and Eagle Mountain Road provide paved access for desert tortoise translocation and follow-up monitoring in the Chuckwalla Recipient Site. Tortoise exclusion fencing is often installed along paved roads to prevent mortality by vehicle strikes. However, fencing also fragments habitat, reducing opportunity for genetic exchange and demographic population shifts. This portion of Kaiser Road serves the communities of Lake Tamarisk to the south of the site and Eagle Mountain to the north, as well as construction and O&M traffic for the DSSF project and future traffic for the DHSP and possibly the EMPSP. Due to the relatively high traffic volume on Kaiser Road expected from these projects, and limited habitat availability east of Kaiser Road, enXco may propose to fence Kaiser Road south of the DHSP site if desert tortoises are translocated to the Chuckwalla Recipient Site.

3.3 DuPont Recipient Site

The proposed DuPont Recipient Site covers approximately 7,460 acres of contiguous public lands within the Chuckwalla CHU and DWMA immediately east of the Chuckwalla Wilderness Area. It is shown on Figure 9 and described below.

USFWS Selection Criteria (2011c; * indicates required criterion)

1. *Desert tortoise habitat suitability. The DuPont Recipient Site supports sandy substrates with small gravel and a sparse Creosote Bush-White Bursage vegetation community with several areas of Blue Palo Verde-Ironwood-Smoke Tree Series vegetation (Desert Dry Wash Woodland).

3.2 Chuckwalla Recipient Site

The proposed Chuckwalla Recipient Site is shown on Figure 8 and described below. The site is located on 1,747 ha (4,317 ac) within the Chuckwalla CHU and DWMA west of Kaiser Road and north of I-10. The northeastern corner of this translocation site is within 1 km (0.6 mi) of the DHSP site.

USFWS Selection Criteria (2011c; * indicates required criterion)

1. *Desert tortoise habitat suitability. The Chuckwalla Recipient Site supports Creosote Bush-White Bursage vegetation and several areas of Blue Palo Verde-Ironwood-Smoke Tree Series vegetation (Desert Dry Wash Woodland), similar to habitats found on the DHSP site. These habitats support all life stages of the desert tortoise (USFWS 2011b).
2. *Disease prevalence. Data on disease prevalence in the resident population are not available. During field surveys for the DSSF project, 28 desert tortoises were observed and no clinical signs of URTD were noted. These data would be collected upon issuance of a Biological Opinion from the USFWS and Consistency Determination or ITP from CDFG.
3. *Minimum 10-km distance from major unfenced roads or highways. The Chuckwalla Recipient Site is within 10 km of I-10. In order for the site to meet this selection criterion, desert tortoise exclusion fencing would be necessary along I-10 south of the site.
4. Within 40 km of the project site, with no natural barriers to movement between them. The Chuckwalla Recipient Site is between 1 and 7 km from the DHSP site. There are no natural barriers to dispersal between the two sites. Kaiser Road, a lightly used paved road, is located between the Chuckwalla Recipient Site and the DHSP site.
5. Resident desert tortoise population depletion. Tortoise densities within the Chuckwalla Recipient Site are lower than the average for the Colorado Desert Recovery Unit. Population densities in the site were estimated at 3.2 tortoises per km² (Ironwood and Woodard 2011), and carcasses were not found in large numbers. The estimated average density is 5.3 tortoises per km² for the Colorado Desert Recovery Unit, and USFWS guidance considers areas "depleted" only if tortoise densities are less than 2.79 animals per km² (USFWS 2011c).
6. Detrimental ROWs or other encumbrances. The Chuckwalla Recipient Site is between Kaiser Road and Eagle Mountain Road, and south of an emergency spillway at the Metropolitan Water District Eagle Mountain Pump Station. There are no designated or proposed detrimental ROWs or other encumbrances within the site. The Land and Mineral Legacy Rehost 2000 data base (LR2000; BLM 2011d) does not show any over-filings or pending applications for use of the Chuckwalla Recipient Site (Ironwood and Woodard 2011).
7. Conservation management. The Chuckwalla Recipient Site is located on BLM-managed lands within the Colorado Desert Recovery Unit and within the Chuckwalla DWMA and CHU.

Desert tortoise field surveys at the Chuckwalla Recipient Site located 28 live tortoises (Ironwood and Woodard 2011). All were observed for signs of URTD, and none of them exhibited obvious clinical signs (Ironwood and Woodard 2011). Based on these data, the USFWS (2011a) estimated that there are 49 subadult and adult desert tortoises; between 9 and 40 juveniles; and that reproductive females may produce approximately 211 eggs per year within the Chuckwalla Recipient Site. All sign of desert tortoise activity, including live animals, intact burrows with or without sign of recent activity, scat (feces), tracks, and mating rings are depicted on Figure 8. The Chuckwalla Recipient Site is close enough to the DHSP site (less than 1.5 km) to be within the home range of tortoises that may be in the western

5. Resident desert tortoise population depletion. The site does not show evidence of desert tortoise population depletion (e.g., numerous carcasses). Tortoise population densities in the site were estimated at 3.4 tortoises per km² (Ironwood and Woodard 2011). The estimated average density is 5.3 tortoises per km² for the Colorado Desert Recovery Unit, and USFWS guidance considers areas ‘depleted’ only if tortoise densities are less than 2.79 animals per km² (USFWS 2011c).
6. Detrimental ROWs or other encumbrances. There are designated road and utility ROWs located within the Sunlight Recipient Site that surround unpaved roads, but they are narrow and infrequently traveled.
7. Conservation management. The Sunlight Recipient Site is located on BLM-managed lands within the Colorado Desert Recovery Unit for the desert tortoise that BLM has committed to managing as a solar exclusion area. However, the site is not within a designated DWMA, CHU, ACEC, Wilderness Area, or on National Park Service lands.

Desert tortoise field surveys at the Sunlight Recipient Site located 32 live tortoises. The USFWS (2011a) estimated that 45 subadult or adult desert tortoises may be within this site, based on density data for JTNP.

All tortoises were observed for signs of URTD, and none of them exhibited obvious clinical signs (Ironwood and Woodard 2011). All sign of desert tortoise activity, including live animals, intact burrows with or without sign of recent activity, scat (feces), tracks, and mating rings are depicted on Figure 7.

The Sunlight Recipient Site is far enough from the DHSP site (3.7 km or 2.3 miles) that it likely is not within the former home range of any tortoise that may be translocated from the DHSP site. The DSSF project, now under construction, presents a substantial anthropogenic barrier between the two sites. However, there are no natural barriers, and desert tortoises at the two sites were likely part of a local genetically related subpopulation. There are no significant anthropogenic “predator subsidies” within the Sunlight Recipient Site, such as food or water sources, that would contribute to increased numbers of ravens, coyotes, or feral dogs and consequent increased predation on desert tortoises.

Kaiser Road provides paved access for desert tortoise translocation and follow-up monitoring in the Sunlight Recipient Site. Tortoise exclusion fencing is often installed along paved roads to prevent mortality by vehicle strikes. However, fencing also fragments habitat, reducing opportunity for genetic exchange and demographic population shifts. This portion of Kaiser Road serves the community of Eagle Mountain, but it is north of most other traffic destinations, including traffic related to the DSSF or DHSP projects. Kaiser Road would, however, be the primary access route to the proposed EMPSP (FERC 2010), if that project is implemented. The Draft EIS for that project includes mitigation measure AQ-6, requiring the applicant to develop a transportation management plan including ride sharing, shuttle transit, and other measures for employees to reduce vehicle trips. That project’s Draft EIS also indicates that a buried water supply line would be built along this portion of Kaiser Road. Due to the low existing traffic volume on Kaiser Road, and regional importance of desert tortoise habitat connectivity (USFWS 2011a), enXco would not propose to fence Kaiser Road if desert tortoises are translocated to the Sunlight Recipient Site. However, further measures may be necessary to minimize hazards to tortoises on Kaiser Road if the EMPSP is approved and constructed.

reduced if the proposed action includes provisions to install and maintain desert tortoise exclusion fencing as a minimization measure.

4. The site is within 40 km of the project site, with no natural barriers to movement between them, to ensure that the desert tortoises at the two sites were likely part of a larger mixing population and similar genetically (note that there are several significant anthropogenic barriers to movement in the areas surrounding the DHSP site, including I-10, Hwy 177, and the above-ground portions of the Colorado River Aqueduct; see Figure 5).
5. The site occurs on lands where desert tortoise populations have been depleted or extirpated yet still support suitable habitat. Depleted areas may include lands adjacent to highways.
6. The site has no detrimental rights-of-way (ROWs) or other encumbrances.
7. The site will be managed for conservation so that potential threats from future impacts are precluded. In the project region, DWMAs, designated critical habitat units (CHUs), areas of critical environmental concern (ACECs), National Park Service lands, and BLM Wilderness Areas are managed for conservation.

Sections 3.1 through 3.3, below, assess the three potential recipient sites in terms of the USFWS selection criteria listed above. As shown on Figure 6, the three potential recipient sites are also modeled as having habitat potential equal to or greater than that modeled on the DSSF and DHSP sites (Nussear et al. 2009). If the identified sites cannot be used for translocation purposes due to density thresholds or disease prevalence, alternate recipient site(s) will be identified in consultation with CDFG, USFWS, and BLM.

3.1 Sunlight Recipient Site

The proposed Sunlight Recipient Site is shown on Figure 7 and described below. The Sunlight Control Site is 1,613 ha (3,986 ac), located north of the DSSP boundary.

USFWS Selection Criteria (2011c; * indicates required criterion)

1. *Desert tortoise habitat suitability. The Sunlight Recipient Site supports Creosote Bush-White Bursage vegetation and several areas of Blue Palo Verde-Ironwood-Smoke Tree Series vegetation (Desert Dry Wash Woodland), similar to habitats found on the DHSP site. These habitats support all life stages of the desert tortoise (USFWS 2011b).
2. *Disease prevalence. Data on disease prevalence in the resident population are not available. During field surveys for the DSSF project, 32 desert tortoises were observed and no clinical signs of URTD were noted. These data would be collected upon issuance of a Biological Opinion from the USFWS and Consistency Determination or Incidental Take Permit (ITP) from CDFG.
3. *Minimum 10 km distance from major unfenced roads or highways. The closest point of the Sunlight Recipient Site is approximately 15 km (9 miles) north of I-10. Kaiser Road is located at the western boundary of the mapped recipient site. It is unfenced, but is not a major road or highway.
4. Within 40 km of the project site, with no natural barriers to movement between them. The mapped site described in the DSSF Translocation Plan is 4 to 11 km from the DHSP site. There are no natural barriers to dispersal between the two sites.

3. Recipient and Control Sites

This section describes the proposed recipient and control sites in terms of the most recent USFWS guidance document and protocols for the preparation of desert tortoise translocation plans (USFWS 2011c; J. Fraser, USFWS, personal communication 2011). The 3 recipient sites and the control site proposed in this Translocation Plan are the same sites that were reviewed for the adjacent DSSF Project (now under construction). For that project's Desert Tortoise Translocation Plan, Ironwood and Woodard (2011) used Geographic Information System (GIS) software to assess lands located within 40 kilometers (22 miles) of the DSSF site boundaries to identify potential recipient sites. They identified 3 suitable recipient sites and 1 control site for that project, based on a series of recipient site selection criteria developed from then-current USFWS (2009; 2010b) guidelines and consultation with BLM, CDFG, and USFWS. The same sites are proposed as recipient and control sites for the DHSP Translocation Plan because of their suitability for the DSSF project, and because any tortoises that would be translocated from the DHSP site would be from the same population as those translocated for the DSSF Project.

To date, 4 desert tortoises have been located in the portions of the DSSF project currently under construction. These tortoises have been or will be translocated to the Sunlight Recipient Site, (below). Based on discussions with USFWS, BLM, and CDFG biologists, this translocation plan ranks the three potential recipient sites in order of preference as follows:

1. Sunlight Recipient Site. The Sunlight Recipient Site is the preferred translocation site due to its proximity to the DHSP site and relative distance from hazards, such as busy roads; however, depending on the final number of tortoises translocated from the DSSF site into the Sunlight Recipient Site, it may be unsuitable for additional translocated animals due to potential for overcrowding.
2. Chuckwalla Recipient Site. The Chuckwalla Recipient Site is ranked second, due to its proximity to the DHSP site and its location within the Chuckwalla Desert Wildlife Management Area (DWMA). However, the proposed Eagle Mountain Pumped Storage Project (EMPSP) Draft EIS (FERC 2010) indicates that the gen-tie line for that project may be built along Eagle Mountain Road, at the eastern boundary of the Chuckwalla Recipient Site, which could contribute to habitat degradation and the potential for injury or mortality to translocated tortoises from construction, O&M, or decommissioning activities associated with that line.
3. DuPont Recipient Site. The DuPont Recipient Site is ranked third, due to its distance from the DHSP site.

Since finalization of the DSSF Translocation Plan, the USFWS has revised its Translocation Plan Guidance (2011c). The most recent guidance document lists seven criteria for consideration in selecting prospective recipient sites, noting that sites failing to meet criteria 1-3 (noted with asterisks) will be disqualified from consideration. In addition, the revised guidance defines recipient sites to encompass the area within a 6.5-km radius of the set of release points, to account for expected dispersal following release.

1. *The site supports desert tortoise habitat suitable for all life stages. [Note that reviews of desert tortoise habitat and ecology, e.g., USFWS 2011b, do not distinguish among life stages in descriptions of suitable habitat].
2. *Disease prevalence within the resident desert tortoise population is less than 20 percent.
3. *The site is at least 10 km from major unfenced roads or highways. Distance from roads may be

tortoises or recent sign were observed within the DHSP survey area. However, several desert tortoise burrows, designated as class 2 (good condition) and class 3 (deteriorated condition), and several disarticulated bone fragments possibly originating from a desert tortoise, were located in the larger northeastern parcel of the solar generator site, and eight possible desert tortoise burrows, designated as class 5 (possibly tortoise, good condition), were observed in the smaller southwestern parcel. One additional class 5, possible desert tortoise burrow, was also observed offsite, within the perimeter transects for the southwestern parcel. Figure 2, *Desert Tortoise Survey Results*, identifies the locations of desert tortoise sign encountered during desert tortoise surveys for the DHSP. None of the burrows or other sign observed in 2010 and 2011 exhibited any evidence of recent use or corroborating sign.

The nearest documented desert tortoise locations are on the DSSF site, north of the DHSP site (BLM 2011c). Tortoises and recent sign were found on the DSSF site, about 0.3 mile north of the DHSP site, and along the proposed gen-tie alignment for the proposed action (BLM 2011c and Figures 3 and 4). In addition, a road-killed desert tortoise was observed at the Eagle Mountain off ramp on east-bound Interstate 10, approximately 6.5 miles southwest of the DHSP site, by biologists en route to the DHSP site in 2010 (AMEC 2011a).

Desert tortoises are found throughout the region and are mobile during their active seasons. Based on the presence of desert tortoise sign on the DHSP site and on active desert tortoises on the adjacent DSSF site and associated gen-tie alignments, the entire DHSP site and all gen-tie alternative alignments may be occupied by desert tortoises at any time, albeit in low numbers.

The USFWS (2010a) provides a mathematical formula for estimating actual numbers of adult and sub-adult desert tortoises from field survey data. However, this formula is not applicable for the available field data for the proposed action because no living tortoises were observed within the project site. The actual number of desert tortoises on the project site as of the commencement of construction cannot be determined from field survey data alone, due to the possibility that tortoises may have been overlooked during surveys (i.e., underground in burrows, eggs in an underground nest, juveniles in various types of refugia, etc.) or may have moved onto the site since surveys were completed. This Translocation Plan anticipates that 5 or fewer tortoises occur on the DHSP site, and would necessitate translocation prior to construction. However, this Plan also includes provisions for expanded monitoring to be implemented if more than 5 tortoises must be translocated, consistent with USFWS guidance (2011c). This is a conservative approach and it is likely that fewer tortoises, or none at all, may be found on the DHSP site during preconstruction surveys and would necessitate translocation.

Active desert tortoise sign was documented along the DSSF gen-tie line during surveys for that project. The DHSP would share the same gen-tie alignment. The northern portion of the gen-tie line along Kaiser Road lacked evidence of recent tortoise activity. Active sign was found along the gen-tie line east of Highway 177 and north of I-10, including one live tortoise observed within 30 meters of the center of the gen-tie line (Ironwood and Woodard 2011). Abundance and distribution of desert tortoises and sign are not described in further detail because off-site translocation of desert tortoises is not proposed for the gen-tie component of the DHSP. Instead, any tortoises observed in the vicinity of gen-tie work areas would be monitored and work activities would be scheduled or modified to avoid any potential take. If necessary, tortoises may be translocated no more than 500 meters, out of harm's way.

desert tortoises during the construction, O&M, and decommissioning phases of the proposed action;

3. The details of the long-term monitoring and reporting program to track the effectiveness of the translocation effort.

This Translocation Plan builds on concepts and general translocation ideals with nearby solar projects, reviewed and approved by USFWS, CDFG, and BLM.

1.1 Draft Environmental Impact Statement and Biological Assessment

The Final DHSP Translocation Plan will conform to the following Applicant-Proposed Measure (AM-BIO-6) and to the requirements of (i) relevant provisions of the DHSP Project's Environmental Impact Statement, (ii) any USFWS Biological Opinion (BO) or CDFG Incidental Take Permit (ITP) issued for the DHSP Project, and (iii) any revisions to relevant mitigation measures that may be adopted in the BLM Record of Decision for the project.

AM-BIO-6 A **Draft Desert Tortoise Translocation Plan** will be prepared for the project and will be implemented by the Applicant to ensure that construction monitoring will be conducted by BLM-, USFWS-, and CDFG-approved biologists during all construction activities, and that any desert tortoise found with the construction zone will be translocated to a suitable location outside of the project footprint. The Final Plan will conform to the 2010 USFWS desert tortoise relocation guidelines entitled *Translocation of Desert Tortoise (Mojave Population) From Project Sites: Plan Development Guidance* (unpublished report dated August 2010).

1.2 Biological Opinion

To be completed upon issuance of the BO

2. Estimated Number of Desert Tortoises

The DHSP site is within the Colorado Desert Recovery Unit as identified in the *Revised Recovery Plan for the Mojave Population of the Desert Tortoise* (USFWS 2011b). The Revised Recovery Plan is the most current document describing USFWS's strategy for desert tortoise recovery and reflects the most current understanding of desert tortoise biology. The Colorado Desert Recovery Unit as recognized in the Revised Recovery Plan comprises two recovery units recognized in the prior Recovery Plan (USFWS 1994) as the Eastern Colorado Desert and Northern Colorado Desert Recovery Units.

Reliable estimates of desert tortoise densities for the region surrounding the proposed action area are not available. Tortoise densities were estimated at approximately 6.9 animals per square kilometer, based on range-wide sampling data collected between 2001 and 2007 for the formerly recognized Eastern Colorado Recovery Unit (USFWS 2011b). However, these densities vary widely throughout the recovery unit. The USFWS has concluded that too few data are available to support a confident estimate of tortoise densities in the region, but that the ratio of carcasses to live animals found in recent range-wide sampling was low, which may indicate a relatively stable population. The current density estimate for the Colorado Desert Recovery Unit is 5.3 tortoises per square kilometer (USFWS 2011c).

Desert tortoise surveys were conducted on the DHSP site in 2010 and 2011 by AMEC Earth and Environmental (AMEC 2011a; 2011b) in accordance with the USFWS survey protocol *Preparing for any Action that may Occur within the Range of the Mojave Desert Tortoise* (USFWS 2010a). No live desert

1. INTRODUCTION

enXco Development Corporation (enXco or Applicant) has applied to the Bureau of Land Management (BLM) for an issuance of a right-of-way (ROW) grant that would authorize construction, operation, maintenance, and decommission of the proposed Desert Harvest Solar Project (DHSP) and generator intertie (gen-tie) transmission line (together referred to as the proposed action). The proposed action is a commercial solar power-generating facility on over 1,200 acres of BLM-managed lands, and the gen-tie line would traverse 12.1 miles of both BLM-managed lands and private lands under the jurisdiction of Riverside County. enXco's objective for the DHSP is to construct and operate a 150 megawatt (MW) renewable energy resource. The DHSP has a minimum expected lifetime of 30 years, with an opportunity of 50 years or more with equipment replacement and repowering. The DHSP and several alternatives to the proposed action are currently under BLM review, pursuant to the National Environmental Policy Act (NEPA).

The proposed action area is located in Riverside County, in the upper Chuckwalla Valley approximately 5 miles north of the rural community of Desert Center (Figure 1, *Regional Location*; all figures are located at the end of this document). Joshua Tree National Park (JTNP) surrounds the upper Chuckwalla Valley on the north, east, and west. To the north, the JTNP boundary is about 7 miles from the northern boundary of the proposed solar field site. The Coxcomb Mountains, in the southeastern corner of JTNP, are located about 1.8 miles northeast of the northeastern corner of the site. To the west, the JTNP boundary is about 3.5 miles from the western boundary of the DHSP boundary at Kaiser Road.

Complete details of project locations and description are found in the *Desert Harvest Solar Project Draft EIS and CDCA Plan Amendment* (BLM 2011a), the *Biological Resources Technical Report, Desert Harvest Solar Project* (Aspen 2011), and in the *Biological Assessment, Desert Harvest Solar Project* (BLM 2011b).

The federally and state listed threatened desert tortoise (*Gopherus agassizii*) occurs in the project vicinity. No live desert tortoises or recent sign were observed on the DHSP site or adjacent areas during the 2010 and 2011 protocol-level field surveys (AMEC 2011a; 2011b). However, several desert tortoise burrows, designated as class 2 (good condition) and class 3 (deteriorated condition), and several disarticulated bone fragments, possibly originating from a desert tortoise, were located on the site. Active desert tortoises and sign were located on the adjacent Desert Sunlight Solar Farm (DSSF) site and on the gen-tie alignment proposed for DSSF and DHSP (Ironwood and Woodard 2011). The occurrence of tortoise sign, even where no living tortoises are found during surveys, indicates desert tortoise presence (US Fish and Wildlife Service; USFWS 2010a). Desert tortoises are found throughout the region and are mobile during their active seasons. Based on the presence of desert tortoises and active burrows on the adjacent project site and gen-tie alignments, the entire DHSP site and gen-tie alignment may be occupied by desert tortoises at any time, albeit only in low numbers. Take of desert tortoises requires authorization from the USFWS and California Department of Fish and Game (CDFG) under the federal and California Endangered Species Acts (ESA and CESA, respectively). This Translocation Plan describes enXco's proposed translocation methods and locations for any desert tortoises that may be found within the DHSP site prior to construction. This Plan has been prepared to support the BLM's consultation with USFWS under Section 7 of the federal ESA and state permitting under CESA.

The purposes of this Desert Tortoise Translocation Plan are to provide:

1. Estimates of the number of desert tortoises that may be present on the DHSP site;
2. Detailed descriptions of the methods to be used to translocate any tortoises present on the DHSP site at the time of project construction in order to avoid and minimize potential "take" of

ACRONYMS AND ABBREVIATIONS

Area of Critical Environmental Concern	ACEC
AMEC Earth & Environmental, Inc.	AMEC
Applicant	enXco Development Corporation
Biological Assessment	BA
Bureau of Land Management	BLM
Biological Opinion	BO
California Department of Fish and Game	CDFG
California Endangered Species Act	CESA
Critical Habitat Unit	CHU
Draft Environmental Impact Statement	DEIS
Desert Harvest Solar Project	DHSP
Desert Sunlight Solar Farm Project	DSSF
Desert Tortoise Conservation Center	DTCC
Desert Wildlife Management Area	DWMA
Environmental Impact Statement	EIS
enXco Development Corporation	enXco
Eagle Mountain Pumped Storage Project	EMPSP
Federal Endangered Species Act	ESA
Final Environmental Impact Statement	FEIS
Generator intertie transmission line	gen-tie
Incidental Take Permit	ITP
Kilometer (0.62 mi)	km
Joshua Tree National Park	JTNP
Megawatt	MW
Memorandum of Understanding	MOU
National Environmental Policy Act	NEPA
Desert Harvest Solar Project and associated generation intertie transmission line	Proposed action
Right-of-way	ROW
Upper respiratory tract disease	URTD
U.S. Fish and Wildlife Service	USFWS
Worker Environmental Awareness Program	WEAP

8.1	ROLES AND RESPONSIBILITIES	23
8.1.1	Designated Biologist.....	23
8.1.2	Biological Monitors	25
8.2	PROJECT APPLICANT	25
8.3	BUREAU OF LAND MANAGEMENT.....	25
8.4	U.S. FISH AND WILDLIFE SERVICE.....	25
8.5	CALIFORNIA DEPARTMENT OF FISH AND GAME	26
LITERATURE CITED		26

List of Tables

TABLE 1. ACTION PLAN AFTER RECEIVING ELISA TEST RESULTS	19
TABLE 2. TRANSLOCATION OF DESERT TORTOISES AND EGGS	20

List of Figures

FIGURE 1. REGIONAL LOCATION
FIGURE 2. DESERT TORTOISE SURVEY RESULTS
FIGURE 3. ACTIVE DESERT TORTOISE SIGN – DESERT SUNLIGHT SOLAR FARM PROJECT
FIGURE 4. ACTIVE DESERT TORTOISE SIGN – GEN-TIE LINE
FIGURE 5. REGIONAL BARRIERS TO MOVEMENT
FIGURE 6. TRANSLOCATION SITES
FIGURE 7. SUNLIGHT RECIPIENT SITE
FIGURE 8. CHUCKWALLA RECIPIENT SITE
FIGURE 9. DUPONT RECIPIENT SITE

Contents

LIST OF TABLES	II
LIST OF FIGURES.....	II
ACRONYMS AND ABBREVIATIONS	III
1. INTRODUCTION	1
1.1 DRAFT ENVIRONMENTAL IMPACT STATEMENT AND BIOLOGICAL ASSESSMENT	2
1.2 BIOLOGICAL OPINION	2
2. ESTIMATED NUMBER OF DESERT TORTOISES	2
3. RECIPIENT AND CONTROL SITES	4
3.1 SUNLIGHT RECIPIENT SITE.....	5
3.2 CHUCKWALLA RECIPIENT SITE	7
3.3 DUPONT RECIPIENT SITE	8
3.4 CONTROL SITE	10
4. METHODS FOR DESERT TORTOISE TRANSLOCATION.....	10
4.1 OVERVIEW.....	10
4.2 DESIGNATED BIOLOGIST AND BIOLOGICAL MONITORS	12
4.3 TORTOISE EXCLUSION FENCE.....	12
4.4 PRE-CONSTRUCTION CLEARANCE SURVEYS	13
4.5 DESERT TORTOISE HANDLING AND DISPOSITION.....	14
4.6 SURVEYS AND DISEASE TESTING AT RECIPIENT AND CONTROL SITES.....	17
4.7 LINEAR PROJECT COMPONENTS	18
5. MONITORING AND REPORTING.....	19
5.1 PROJECT COMPONENT MONITORING FOR DESERT TORTOISES: CONSTRUCTION, O&M, AND DECOMMISSIONING	19
5.2 TRANSLOCATED DESERT TORTOISES, RECIPIENT SITE, AND CONTROL SITE MONITORING	20
5.2.1 Health Monitoring.....	21
5.2.2 Vegetation Monitoring.....	21
5.3 REPORTING	22
5.3.1 Reporting During Translocation	22
5.3.2 Reporting During Long-Term Monitoring	22
5.3.3 Final Report.....	22
6. ADAPTIVE MANAGEMENT	23
7. ALTERNATIVE TO TRANSLOCATION	23
8. ROLES AND RESPONSIBILITIES AND PROJECT CONTACTS	23

DRAFT Desert Tortoise Translocation Plan

Desert Harvest Solar Project

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Appendix C.8

Draft Desert Tortoise Translocation Plan

Rodentia | Heteromyidae

Desert Kangaroo Rat *Dipodomys deserti*

Merriam's Kangaroo Rat *Dipodomys merriami*

Artiodactyla | Cervidae

Mule Deer *Odocoileus hemionus*

Reptiles

Testudines | Testudinidae

Desert Tortoise *Gopherus agassizii*

Squamata | Phrynosomatidae

Side-blotched Lizard *Uta stansburiana*

Passeriformes - Passerine Birds | Corvidae - Crows and Jays
Common Raven *Corvus corax*

Passeriformes - Passerine Birds | Alaudidae - Larks
Horned Lark *Eremophila alpestris*

Passeriformes - Passerine Birds | Remizidae - Penduline Tits and Verdins
Verdin *Auriparus flaviceps*

Passeriformes - Passerine Birds | Troglodytidae - Wrens
Cactus Wren *Campylorhynchus brunneicapillus*
Rock Wren *Salpinctes obsoletus*

Passeriformes - Passerine Birds | Polioptilidae - Gnatcatchers and Gnatwrens
Blue-gray Gnatcatcher *Polioptila caerulea*
Black-tailed Gnatcatcher *Polioptila melanura*

Passeriformes - Passerine Birds | Turdidae - Thrushes
Western Bluebird *Sialia mexicana*
Mountain Bluebird *Sialia currucoides*

Passeriformes - Passerine Birds | Mimidae - Mockingbirds and Thrashers
Sage Thrasher *Oreoscoptes montanus*
California Thrasher *Toxostoma redivivum*

Passeriformes - Passerine Birds | Sturnidae - Starlings
European Starling *Sturnus vulgaris*

Passeriformes - Passerine Birds | Ptilonotidae - Silky-flycatchers
Phainopepla *Phainopepla nitens*

Passeriformes - Passerine Birds | Parulidae - Wood-Warblers
Yellow-rumped Warbler *Setophaga coronata*

Passeriformes - Passerine Birds | Emberizidae - Emberizids
Black-throated Sparrow *Amphispiza bilineata*
White-crowned Sparrow *Zonotrichia leucophrys*

Passeriformes - Passerine Birds | Fringillidae - Fringilline and Cardueline Finches and Allies
House Finch *Carpodacus mexicanus*
Lesser Goldfinch *Spinus psaltria*

Passeriformes - Passerine Birds | Passeridae - Old World Sparrows
House Sparrow *Passer domesticus*

Mammals

Lagomorpha | Leporidae
Black-tailed Jackrabbit *Lepus californicus*

Rodentia | Sciuridae
White-tailed Antelope Squirrel *Ammospermophilus leucurus*

APPENDIX A. FAUNAL COMPENDIUM

Birds

Anseriformes - Screamers, Swans, Geese, and Ducks | Anatidae - Ducks, Geese, and Swans
Canada Goose *Branta canadensis*

Galliformes - Gallinaceous Birds | Odontophoridae - New World Quail
Mountain Quail *Oreortyx pictus*
Gambel's Quail *Callipepla gambelii*

Pelecaniformes - Pelicans, Herons, Ibises, and Allies | Ardeidae - Herons, Bitterns, and Allies
Great Egret *Ardea alba*

Accipitriformes - Hawks, Kites, Eagles, and Allies | Cathartidae - New World Vultures
Turkey Vulture *Cathartes aura*

Accipitriformes - Hawks, Kites, Eagles, and Allies | Accipitridae - Hawks, Kites, Eagles, and Allies
Sharp-shinned Hawk *Accipiter striatus*
Cooper's Hawk *Accipiter cooperii*
Red-tailed Hawk *Buteo jamaicensis*
Golden Eagle *Aquila chrysaetos*

Falconiformes - Caracaras and Falcons | Falconidae - Caracaras and Falcons
American Kestrel *Falco sparverius*
Prairie Falcon *Falco mexicanus*

Gruiformes - Rails, Cranes, and Allies | Rallidae - Rails, Gallinules, and Coots
American Coot *Fulica americana*

Columbiformes - Pigeons, and Doves | Columbidae - Pigeons and Doves
Eurasian Collared-Dove *Streptopelia decaocto*
Mourning Dove *Zenaida macroura*

Cuculiformes - Cuckoos and Allies | Cuculidae - Cuckoos, Roadrunners, and Anis
Greater Roadrunner *Geococcyx californianus*

Strigiformes - Owls | Strigidae - Typical Owls
Long-eared Owl *Asio otus*

Apodiformes - Swifts, and Hummingbirds | Apodidae - Swifts
White-throated Swift *Aeronautes saxatalis*

Piciformes - Puffbirds, Jacamars, Toucans, Woodpeckers, and Allies | Picidae - Woodpeckers and Allies
Ladder-backed Woodpecker *Picoides scalaris*

Passeriformes - Passerine Birds | Tyrannidae - Tyrant Flycatchers
Black Phoebe *Sayornis nigricans*
Say's Phoebe *Sayornis saya*

Passeriformes - Passerine Birds | Laniidae - Shrikes
Loggerhead Shrike *Lanius ludovicianus*

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three on February 1, 2012. While Golden Eagles are capable of killing large prey such as cranes, wild ungulates, and domestic livestock, smaller game such as rabbits, hares, ground squirrels, and prairie dogs are most important (Bloom and Hawks 1982, Olendorff 1976). As jackrabbit population levels are cyclical, it is unclear if the relatively low number of jackrabbits detected during the surveys were an indication of poor habitat quality or reflect numbers indicative of the low end of population fluctuation.

Golden Eagles typically reach sexual maturity, form territories and begin nesting at four years of age. Pairs generally stay within the limits of their territory, which can measure 20–30 square kilometers, and within that territory can have as many as 14 nests (Bloom pers. obs.) which a pair maintains and repairs as part of its courtship ritual. Over the course of a decade several of these nests will be used and will produce young, others may only be maintained with the periodic addition of fresh sticks. Most alternate nests are important in the successful reproduction of a pair of eagles. Pairs commonly refrain from laying eggs in some years, particularly when prey is scarce.

Given the presence of Golden Eagles and at least eight confirmed or probable Golden Eagle nests in the study area, but the lack of any indication of recent nest activity, it is the opinion of BBI that although Golden Eagles are present in the study area, they may not have recently nested within it because of low prey levels. BBI recommends that winter and springs surveys for Golden Eagle be conducted yearly until project construction is completed.

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energy plants might have on the environment at the local level. It is well-established that Golden Eagles and other raptors are vulnerable to mortality through collision with wind turbines (Orloff and Flannery 1992, PBRG 1997, Madders and Walker 2002). For solar facilities, potential effects on wildlife are in the early stages of investigation, but it is expected that raptors and other species could suffer adverse effects due to reduced foraging habitat, and potentially, a reduction in the prey base also caused by habitat loss for prey species. Specifically, BBI has identified the following potential adverse effects on Golden Eagles attributed to solar projects:

- **Direct Mortality** - Long-term surveys of Golden Eagle populations have shown declines in nesting populations throughout the western United States (Kochert and Steenhof 2002). Franson et al. (1995) found that humans cause >70% of recorded deaths, with the leading causes being accidental trauma (collisions with vehicles, power lines, or other structures, 27%), electrocution (25%), gunshot (15%), and poisoning (6%). Lead poisoning in California has also been identified as an important mortality factor with > 30% of a population having elevated levels (Bloom et al. 1989, Pattee et al. 1990).

Electrocution is a particular risk potentially posed by infrastructure associated with many solar projects. Golden Eagles are vulnerable to electrocution when landing on power poles, with the risk increasing when inclement weather hampers flight or when wet feathers increase conductivity (Avian Power Line Interaction Committee 1996). Harness and Wilson (2001) reported that ≥ 272 Golden Eagle electrocution deaths occurred in western North America from 1986 to 1996. Poles with cross arms diagonal or parallel to prevailing winds are most lethal (Benson 1981, Harness and Wilson 2001).

For this proposed project, the specifics of the proposed electrical infrastructure are unknown to BBI at this time. BBI recommends that electrocution risk be minimized through the use of bird-safe pole designs.

- **Nest Failures** - Golden Eagles may desert nests in early incubation if disturbed by humans (Thelander 1974), and potential desertion may not be noticed early through behavioral cues as Golden Eagles are not aggressive toward humans in the nest vicinity and will simply leave and not return to the area for hours (Camenzind 1969), if ever. While data collected in this survey suggest that the proposed project is unlikely to cause such an effect directly, project implementation could contribute to cumulative or growth-inducing impacts, ultimately causing additional anthropogenic disturbance in the area over time.
- **Indirect Mortality** - Management of healthy eagle populations requires maintaining prey habitat in foraging areas (Kochert et al. 2002), as the availability of food and nesting sites is the primary factor determining nesting density of Golden Eagles (Hunt et al. 1995), and reproductive rates of Golden Eagles often fluctuate with prey densities (Smith and Murphy 1979, Tjernberg 1983, Bates and Moretti 1994, Steenhof et al. 1997, McIntyre and Adams 1999). In southwestern Idaho, Marzluff et al. (1997) have found that behavior and demography of Golden Eagles are closely associated with the abundance of Black-tailed Jackrabbits (*Lepus californicus*), which are themselves dependent on stands of sagebrush/rabbitbrush interspersed with grassland (Knick and Dyer 1997). Bloom and Hawks (1982), working in the Great Basin Desert of northeast California and northwest Nevada, found that 91% of the biomass and 85% of the frequency of prey found in nests were attributed to lagomorphs. Patch sizes of this habitat were found to be an essential feature of Golden Eagle home ranges (Marzluff et al. 1997).

In the study area for this proposed project, BBI biologists stated that there was "a notable absence of prey items on the site". Indeed, Black-tailed Jackrabbits were only observed in small numbers during the surveys, with one on January 6, two on January 10, one on January 20 and

#	Date	Common Name	Scientific Name	Substrate	Height	Notes
106	2012-01-10	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	60	was nest building. inactive, south side of Hwy 10, near hillside
107	2012-01-10	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	60	inactive, near hillside, south side of Hwy 10.
112	2012-01-20	Common Raven	<i>Corvus corax</i>	Other	10	Inactive, old nest, sticks stained with wood rat urine. Nest waypoint is a projected waypoint.
123	2012-01-27	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	90	Golden eagle nest, south side of highway 10, west end of driving route (closest to red canyon rd).
124	2012-01-27	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	90	Golden eagle nest in a tower, south side of highway 10.
125	2012-01-27	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	90	Golden eagle nest in tower, on south side of highway 10. Two large unidentified birds of prey were seen nearby.
126	2012-01-27	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	90	Golden eagle nest on south side of highway 10. There are DPV2 signs indicating ESA (possibly the nest). Location is roughly 2.5 miles southwest of the golden eagle seen several weeks prior.
127	2012-01-27	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	90	Golden eagle nest on a tower on the south side of Highway 10, furthest to the east documented. This nest is 1.5 miles southeast of where the golden eagle was documented several weeks prior.

Table 3. BLM-Provided Golden Eagle Nest Locations

The following table shows Golden Eagle nest locations within the study area provided by the Bureau of Land Management. These nests are also depicted on Exhibit 4.

Waypoint	Active	Elevation	Notes	Easting	Northing	Year
43	N	2358 ft	very old and deteriorated	—	—	2010
44	N	2374 ft		—	—	2010
77	*	1730 ft	*Possibly active	—	—	2010
114	N	3816 ft		—	—	2010
124	*	2878 ft	*Possibly active, possibly new material	—	—	2010
50	Y	2709 ft		—	—	2010
51	N	2175 ft		—	—	2010
53	N	2346 ft		—	—	2010

5.0 CONCLUSIONS & DISCUSSION

While there is currently an effort to build a larger “sustainable” energy infrastructure in the United States and abroad with expected fewer overall environmental effects than the existing hydrocarbon-based infrastructure, conservation biologists are still in the process of establishing what effects alternative

Over the course of the day groups of turkey vultures were seen migrating WNW over Eagle Mountain. The first group of 80 turkey vultures were seen thermaling low below the ridgetop along the slope over by the aqueduct substation (643952, 3742418). This was the area the vultures were seen crossing a few weeks prior. Later in the day 136 turkey vultures were seen passing a little more to the west (639895, 3734170) traveling low and even into the draw/canyon by the old inactive golden eagle nest in the boulder.

One California Species of Special Concern, a Long-eared Owl (*Asio otus*) was flushed from a wash on the south side of the study area on January 10, 2012.

A variety of large bird nests were also documented. These will be described in the following section.

4.2 Golden Eagles & Other Raptors

Golden Eagles are present in the area, but it is uncertain whether they are currently regularly using the proposed project's study area. On January 10, 2012, one adult Golden Eagle was observed soaring near the southeastern edge of the study area just north of Interstate 10 (point 108, Exhibit 4). The eagle was thermaling with approximately 80 Common Ravens (*Corvus corax*) and three Turkey Vultures. No other Golden Eagles were detected during BBI's surveys.

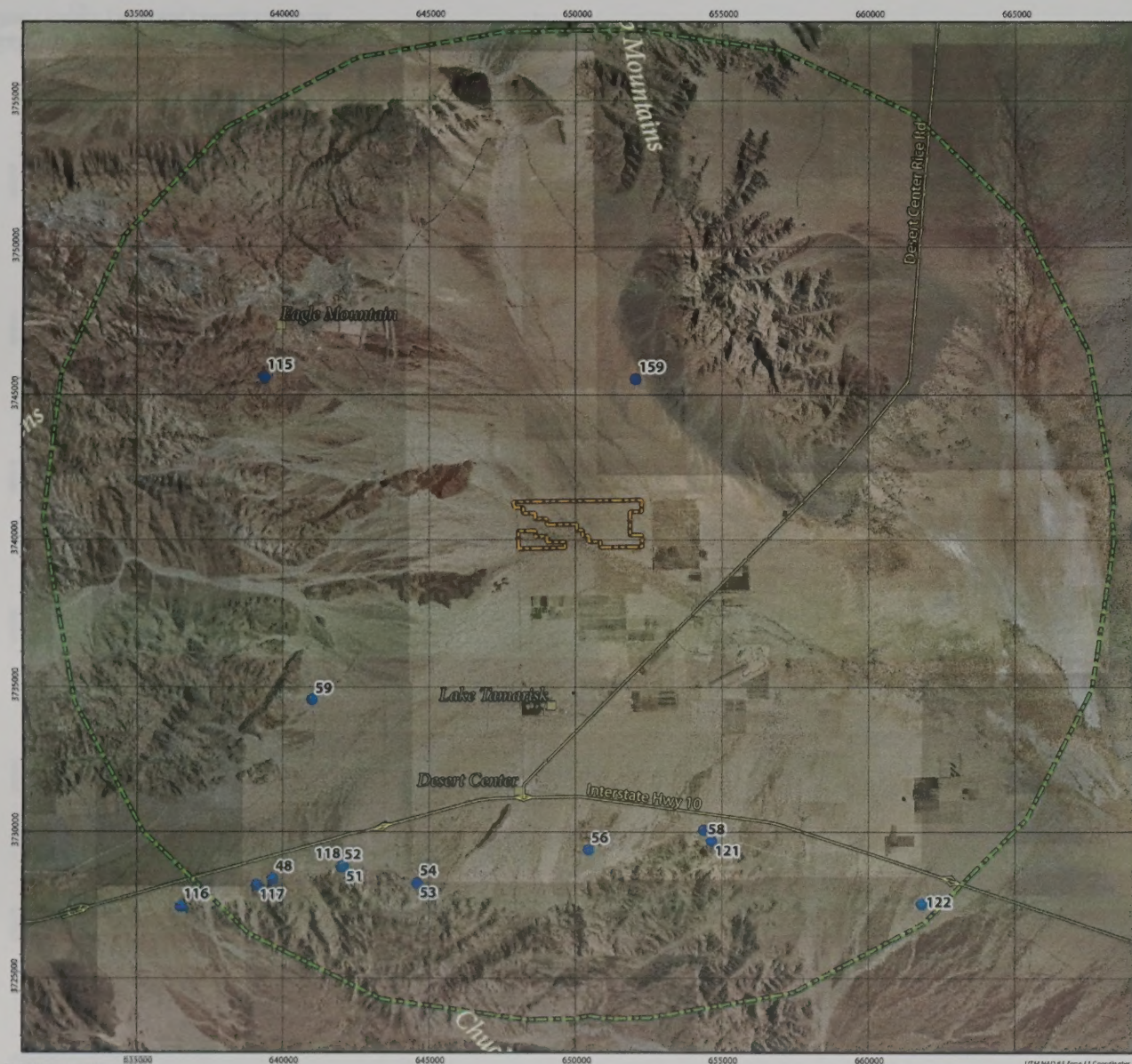
Eight Golden Eagle nests or probable Golden Eagle nests were detected by BBI during the surveys. All were located on utility poles. None of the nests appeared to be recently active. All of the nest locations identified by BBI are shown on Exhibit 4 and in Table 2 below. Eight additional Golden Eagle nest locations from 2010 were provided by the Bureau of Land Management. At least one of these nests was active in 2010. The nests are shown on Exhibit 4 and in Table 3 below.

Uncommon raptor species detected during the surveys include Prairie Falcon (*Falco mexicanus*) with three observed on January 20, 2012 and two observed on February 7, 2012, and the aforementioned Long-eared Owl observed on January 10, 2012. Common raptor species detected during BBI's surveys were Sharp-shinned Hawk (*Accipiter striatus*), Cooper's Hawk (*Accipiter cooperii*), Red-tailed Hawk (*Buteo jamaicensis*), and American Kestrel (*Falco sparverius*). Red-tailed Hawk was the only raptor species, other than Golden Eagle, for which nest locations were detected during BBI surveys. Nests were observed at points 46, 60, and 105 (Exhibit 4 and Table 2).

Table 2. Nest Locations & Descriptions

The following table shows all large bird nests detected during BBI's surveys. These nests are also depicted with their coordinates on Exhibit 4.

#	Date	Common Name	Scientific Name	Substrate	Height	Notes
46	2011-12-22	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Utility Pole	150	South cross arm of tower.
47	2011-12-22	Common Raven	<i>Corvus corax</i>	Utility Pole	150	North arm of tower. Possible Red-tailed Hawk nest.
49	2011-12-22	Common Raven	<i>Corvus corax</i>	Utility Pole	150	North cross arm. Possibly Red-tailed Hawk.
50	2011-12-22	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	150	South of arm of utility tower.
55	2011-12-22	Common Raven	<i>Corvus corax</i>	Utility Pole	150	South cross arm. Could be Red-tailed Hawk or Golden Eagle.
57	2011-12-22	Common Raven	<i>Corvus corax</i>	Utility Pole	150	North arm. Possible Red-tailed Hawk nest.
60	2011-12-22	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Utility Pole	100	None
105	2012-01-10	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Utility Pole	30	Found 6 January 2012, female



Project Site Boundary
Ten Mile Golden Eagle Survey Buffer

Exhibit 5: Photograph Locations Desert Harvest | Riverside County, California



Waypoint: 159
UTM Easting: 652049
UTM Northing: 3745555
Biologist: Karly Moore
Direction: NW
Description: Photo across the sand dune, north of highway 10, east of current solar farm being constructed.

Waypoint: 118
UTM Easting: 652049
UTM Northing: 3745555
Biologist: Karly Moore
Direction: N
Description: Golden eagle nest in a tower on the south side of Highway 10. Two unknown large birds of prey seen in the area.



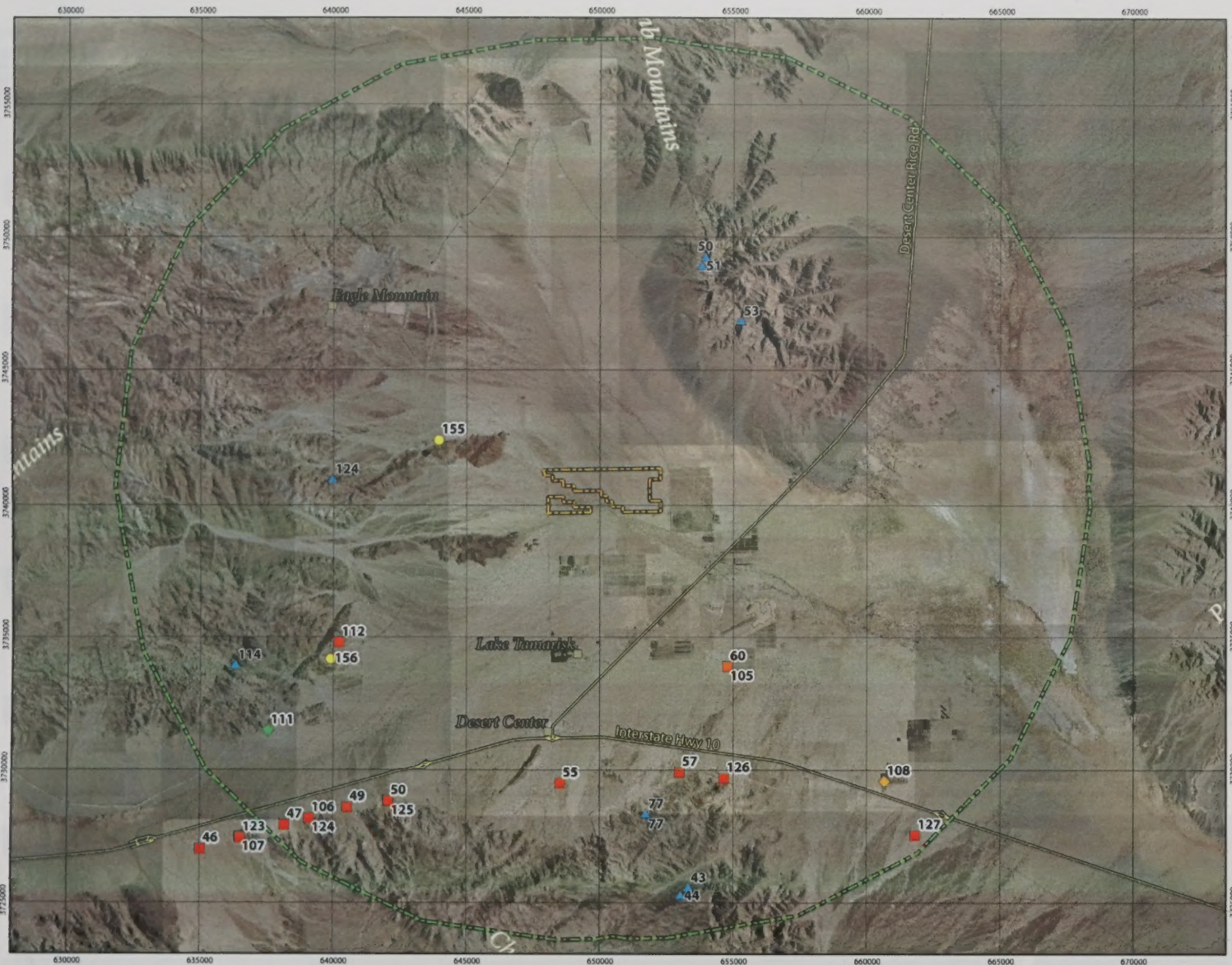
Waypoint: 115
UTM Easting: 639364
UTM Northing: 3745631
Biologist: Karly Moore
Direction: NW
Description: Old, inactive probable Common Raven nest, stained with wood rat urine.

Waypoint: 48
UTM Easting: 639649
UTM Northing: 3728412
Biologist: Marcus C. England
Direction: W
Description: View of power line right of way.



Waypoint: 52
UTM Easting: 642005
UTM Northing: 3728813
Biologist: Marcus C. England
Direction: S
Description: Cliffs that could potentially provide nest locations for Golden Eagle.

Note: Additional photographs available upon request.



Sensitive Birds

#	Date	Common Name	Scientific Name
108	2012-01-10	Golden Eagle	<i>Aquila chrysaetos</i>

Sensitive Reptiles

#	Date	Common Name	Scientific Name
111	2012-01-20	Desert Tortoise	<i>Gopherus agassizii</i>

Other

#	Date	Title
155	2012-02-01	Migrating corridor

Nests

#	Date	Common Name	Scientific Name	Substrate	Height
46	2011-12-22	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Utility Pole	150
47	2011-12-22	Common Raven	<i>Corvus corax</i>	Utility Pole	150
49	2011-12-22	Common Raven	<i>Corvus corax</i>	Utility Pole	150
50	2011-12-22	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	150
105	2012-01-10	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Utility Pole	30
106	2012-01-10	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	60
107	2012-01-10	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	60
112	2012-01-20	Golden Eagle	<i>Aquila chrysaetos</i>	Other	10 feet
123	2012-01-27	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	90 ft
55	2011-12-22	Common Raven	<i>Corvus corax</i>	Utility Pole	150
57	2011-12-22	Common Raven	<i>Corvus corax</i>	Utility Pole	150
60	2011-12-22	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Utility Pole	100
124	2012-01-27	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	90 ft
125	2012-01-27	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	90 ft
126	2012-01-27	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	90 ft
127	2012-01-27	Golden Eagle	<i>Aquila chrysaetos</i>	Utility Pole	90 ft

- Project Site Boundary
 Ten Mile Golden Eagle Survey Buffer
 Nests
 Sensitive Birds
 Sensitive Reptiles
 Other
 BLM-Provided Golden Eagle Nest Locations

0 1 2 3 mi
 1:150,000

UTM NAD 83 Zone 11 Coordinates
 Author: Marcia C. England
 Map Date: 29 March 2012
 Aerial Photography: US Department of Agriculture

Exhibit 4: Biological Resource Observations
 Desert Harvest | Riverside County, California

Date	Time	Weather	Biologists
02/01/12	0715-1615h	the NE No rain; No fog; No snow Start: 53° F, 26-50% cloud cover, Breeze out of the W End: 69° F, 0% cloud cover, Light Wind out of the SW	Peter H. Bloom Karly Moore
02/07/12	0730-1530h	No rain; No fog; No snow Start: 54° F, 100% cloud cover, Breeze out of the E End: 67° F, 100% cloud cover, Breeze out of the W	Peter H. Bloom Karly Moore
		No rain; No fog; No snow	

4.0 RESULTS

4.1 General Biological Conditions

A total of 41 bird, six mammal and two reptile species were observed during BBI's surveys. A comprehensive list of these species is provided in the Faunal Compendium which is attached as Appendix A. Other than Golden Eagle, the most significant resource observation during BBI's surveys was that of a shell fragment of a juvenile or immature Desert Tortoise (*Gopherus agassizii*) near the southwest edge of the study area on January 20, 2012 (point 111, Exhibit 4). The Desert Tortoise is listed as Threatened with Critical Habitat designated under the Federal Endangered Species Act. The project site is located approximately 1.25 miles northeast of the limits of the Chuckwalla Unit of Desert Tortoise Critical Habitat (Service 1994, Figure 2).

Figure 2. Desert Tortoise Critical Habitat Relative to the Project Site and Study area.



Probable migratory corridors, at least for Turkey Vultures (*Cathartes aura*), were detected in the west end of the study area (points 155 and 156, Exhibit 4) by BBI on February 1, 2012. In BBI's project database, biologist Karly Moore noted:

Figure 1. Project Site Location



3.0 METHODS

BBI biologists conducted eight surveys from December 22, 2011 to February 7, 2012. The primary objective of the surveys was to document the locations, if any, of Golden Eagles and Golden Eagle nests observed in the study area. The secondary objective was to document the location of other raptor and corvid nests. BBI biologists documented all other biological resources of potential permitting significance. Surveys were generally completed from sunrise to mid-afternoon or near sunset. Weather conditions varied throughout but were generally seasonable with no rain or other significant weather events that could adversely affect observations. Much of the study area was covered via vehicle on both improved and unimproved roads. Foot travel was necessary for close inspection of nests and viewing of terrain when a vehicle approach did not allow an appropriate vantage point. All findings of biological significance (e.g., nests, sensitive species) were documented with a GPS waypoint and photograph where feasible.

Table 1. Field Survey Dates, Times and Weather Conditions

Date	Time	Weather	Biologists
12/22/11	0830-1610h	Start: 48° F, 0% cloud cover, Strong Wind out of the N End: 50° F, 0% cloud cover, Strong Wind out of the N No rain; No fog; No snow	Peter H. Bloom Marcus C. England
12/28/11	0700-1630h	Start: 55° F, 1-25% cloud cover, Calm out of the W End: 66° F, 1-25% cloud cover, Light Wind out of the W No rain; No fog; No snow	Peter H. Bloom Ryan Thomas
01/06/12	0715-1545h	Start: 46° F, 1-25% cloud cover, Calm out of the N End: 72° F, 0% cloud cover, Calm out of the N No rain; No fog; No snow	Peter H. Bloom Karly Moore
01/10/12	0715-1615h	Start: 37° F, 1-25% cloud cover, Breeze out of the SE End: 65° F, 26-50% cloud cover, Breeze out of the NE No rain; No fog; No snow	Peter H. Bloom Karly Moore
01/20/12	0730-1615h	Start: 49.9° F, 76-99% cloud cover, Breeze out of the NE End: 70° F, 26-50% cloud cover, Breeze out of the E No rain; No fog; No snow	Lee Aulman Karly Moore
01/27/12	0745-1615h	Start: 64.9° F, 76-99% cloud cover, Strong Wind out of the NW End: 70° F, 76-99% cloud cover, Strong Wind out of	Lee Aulman Karly Moore

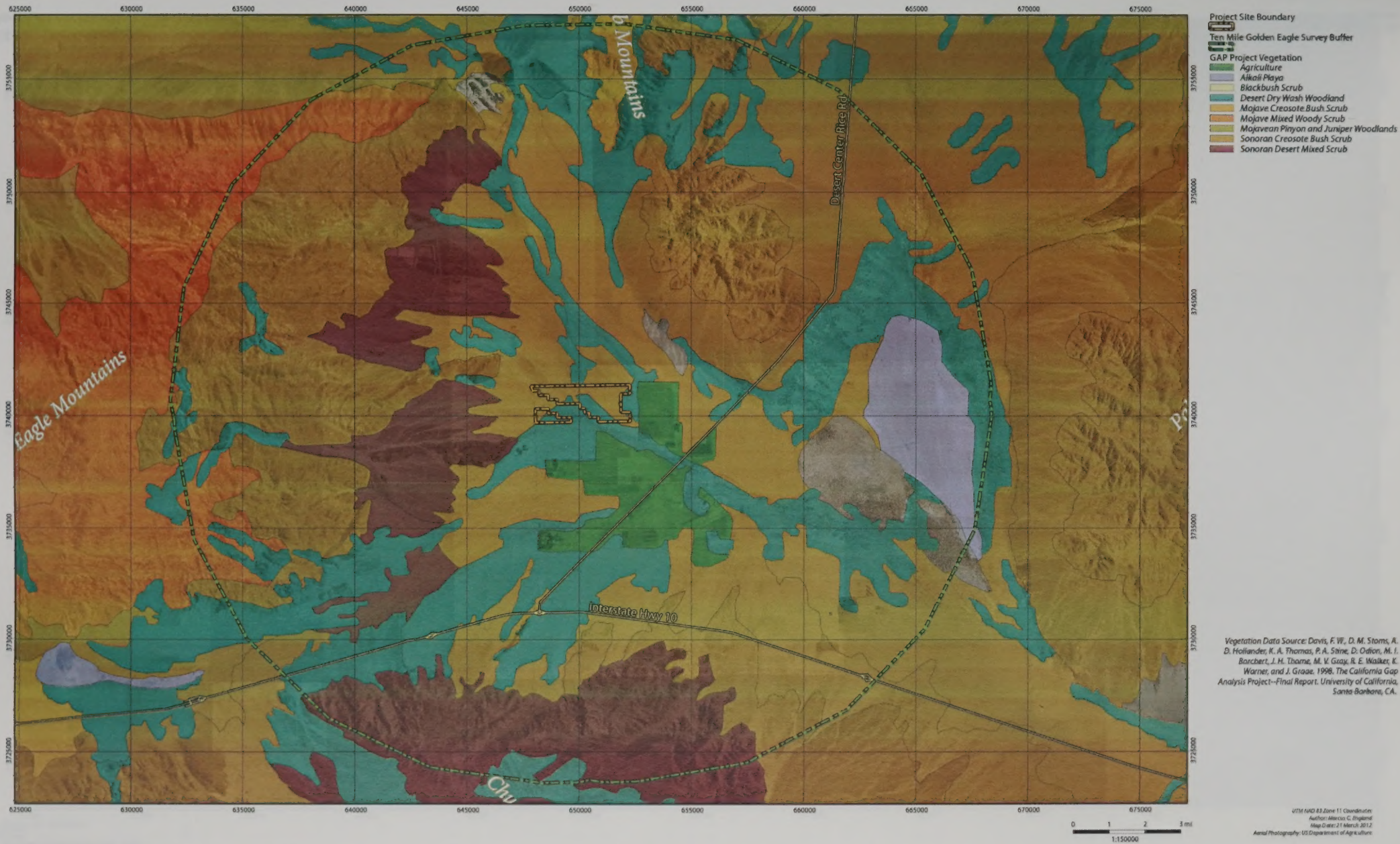


Exhibit 3: GAP Vegetation Communities
 Desert Harvest | Riverside County, California

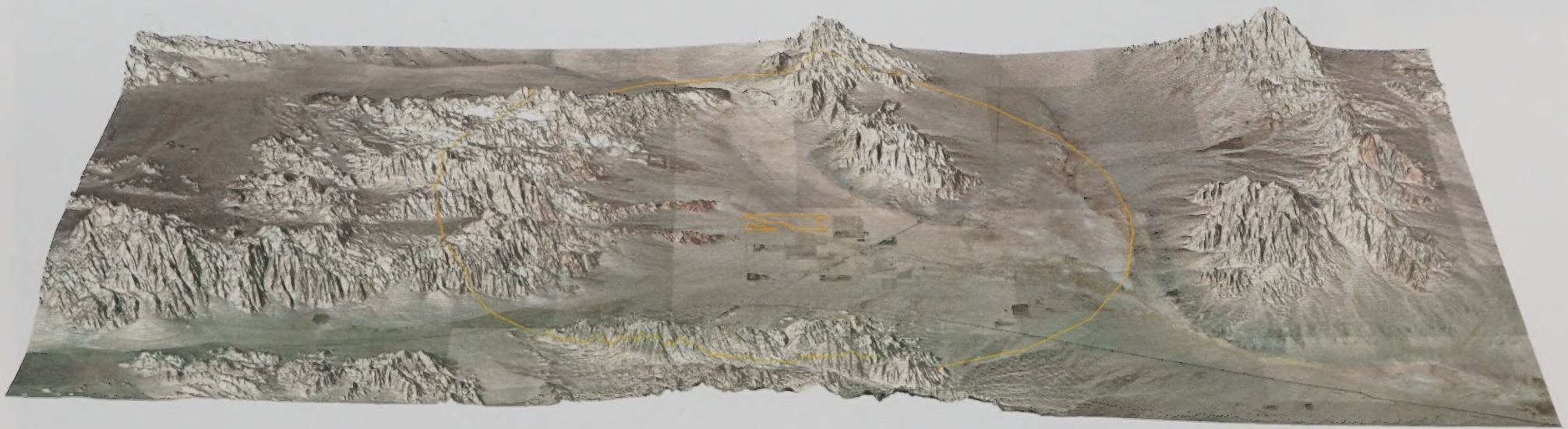


Exhibit 2: Terrain Features
Desert Harvest | Riverside County, California



Exhibit 1: Study Area
 Desert Harvest | Riverside County, California

1.0 INTRODUCTION

Bloom Biological, Incorporated (BBI) was retained by Aspen Environmental Group (Aspen) to conduct winter surveys for Golden Eagle (*Aquila chrysaetos*) for the proposed Desert Harvest Solar Project (project site) located in unincorporated Riverside County, California. The Golden Eagle is an uncommon permanent resident and migrant throughout most of California's foothills, mountains, sage-juniper flats and deserts (CDFG 2008), and is protected under the federal Bald and Golden Eagle Protection Act and by the California Department of Fish & Game as a Fully Protected Species. Golden Eagle status studies completed as recently as 1989 suggested a stable population for much of the western United States (Harlow and Bloom 1989); however, recent evidence suggests that eagle numbers in the western United States are now declining. As a result, the U.S. Fish and Wildlife Service (Service) is recommending focused surveys in nesting habitat within ten miles of proposed projects that might cause anthropogenic disturbances to eagles. Future recommendations regarding Golden Eagle wintering and migratory habitat use are being developed.

The winter survey described in this report will assist BBI and Aspen in further developing impact avoidance and management guidelines for this species in the project area. This report discusses BBI's survey methods, results and recommendations.

2.0 STUDY AREA DESCRIPTION

The project site is comprised of approximately 1,205 acres (488 hectares) of open desert in east-central Riverside County, California (see Figure 1). The site is located on all or portions of Public Land Survey Sections 26 and 27 of Township 4 South, Range 15 East of the US Geological Survey's (USGS) 7.5-minute Victory Pass quadrangle and Section 25 of Township 4 South, Range 15 East of the East of Victory Pass quadrangle. Terrain on the site is flat, with elevations ranging from 584 to 675 feet (178 to 206 meters) above mean sea level (amsl), with a mean elevation of 623 feet (190 meters) amsl.¹ The project site is accessed via County Route R2, which heads north from Desert Center – Rice Road just north of Interstate 10.

The study area for this survey includes the project site and all lands within a ten mile radius of the project site (Exhibits 1 and 2). For the purpose of this document, this region will be referred to as the "study area". The study area is comprised of approximately 247,160 acres (100,022 hectares) located on all or portions of the USGS 7.5-minute Placer Canyon, Pinto Wells, Coxcomb Mountains, West of Palen Pass, Buzzard Spring, Victory Pass, East of Victory Pass, Palen Lake, Hayfield Spring, Desert Center, Corn Spring and Sidewinder Well quadrangles. Terrain in the study area varies from flat to mountainous with elevations ranging from 423 to 3,983 feet (129 to 1,214 meters) amsl, with a mean elevation of 1,204 feet (367 meters) amsl¹. Significant Holland (1986) land cover types in the study area are Agriculture, Alkali Playa, Blackbush Scrub, Desert Dry Wash Woodland, Mojave Creosote Bush Scrub, Mojave Mixed Woody Scrub, Mojavean Pinyon and Juniper Woodlands, Sonoran Creosote Bush Scrub and Sonoran Desert Mixed Scrub² (Exhibit 3). Potential locations for Golden Eagle nesting in the study area include the Eagle Mountains to the west, Coxcomb Mountains to the north, Palen Mountains to the east, and Chuckwalla Mountains to the south. Golden Eagles are also known to build nests on electrical towers, the majority of which run east-west in the southern end of the study area.

¹ Elevation values derived from GRASS GIS version 6.4 using module *r.univar* on a US Geological Survey 1/3-minute digital elevation model.

² Land cover types and extents based on GAP Analysis Project data and determined via a PostGIS/PostgreSQL spatial query.

TABLE OF CONTENTS

1.0	Introduction	1
2.0	Study Area Description	1
3.0	Methods.....	5
4.0	Results	6
4.1	General Biological Conditions.....	6
4.2	Golden Eagles & Other Raptors	9
5.0	Conclusions & Discussion	10
6.0	Literature Cited	12

Tables

Table 1. Field Survey Dates, Times and Weather Conditions	5
Table 2. Nest Locations & Descriptions	9
Table 3. BLM-Provided Golden Eagle Nest Locations.....	10

Figures

Figure 1. Project Site Location.....	5
Figure 2. Desert Tortoise Critical Habitat Relative to the Project Site and Study area.	6

Exhibits

Exhibit 1. Study Area	2
Exhibit 2. Terrain Features.....	3
Exhibit 3. GAP Vegetation Communities.....	4
Exhibit 4. Biological Resource Observations	7
Exhibit 5. Photo Locations.....	8

Appendices

Appendix A. Faunal Compendium	End of Document
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**WINTER GOLDEN EAGLE SURVEY REPORT FOR THE PROPOSED
DESERT HARVEST SOLAR PROJECT LOCATED IN UNINCORPORATED
RIVERSIDE COUNTY, CALIFORNIA**

Prepared for:

Aspen Environmental Group
201 North First Ave., Suite 102
Upland, California 91786

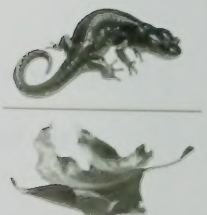
Contact: Scott D. White

Prepared by:

Bloom Biological, Inc.
31611 Hewes Avenue
Santa Ana, California 92705

Contact: Marcus C. England
(213) 304-1826

March 2012



Bloom Biological, Inc.
Research | Consulting | Conservation

Appendix C.7

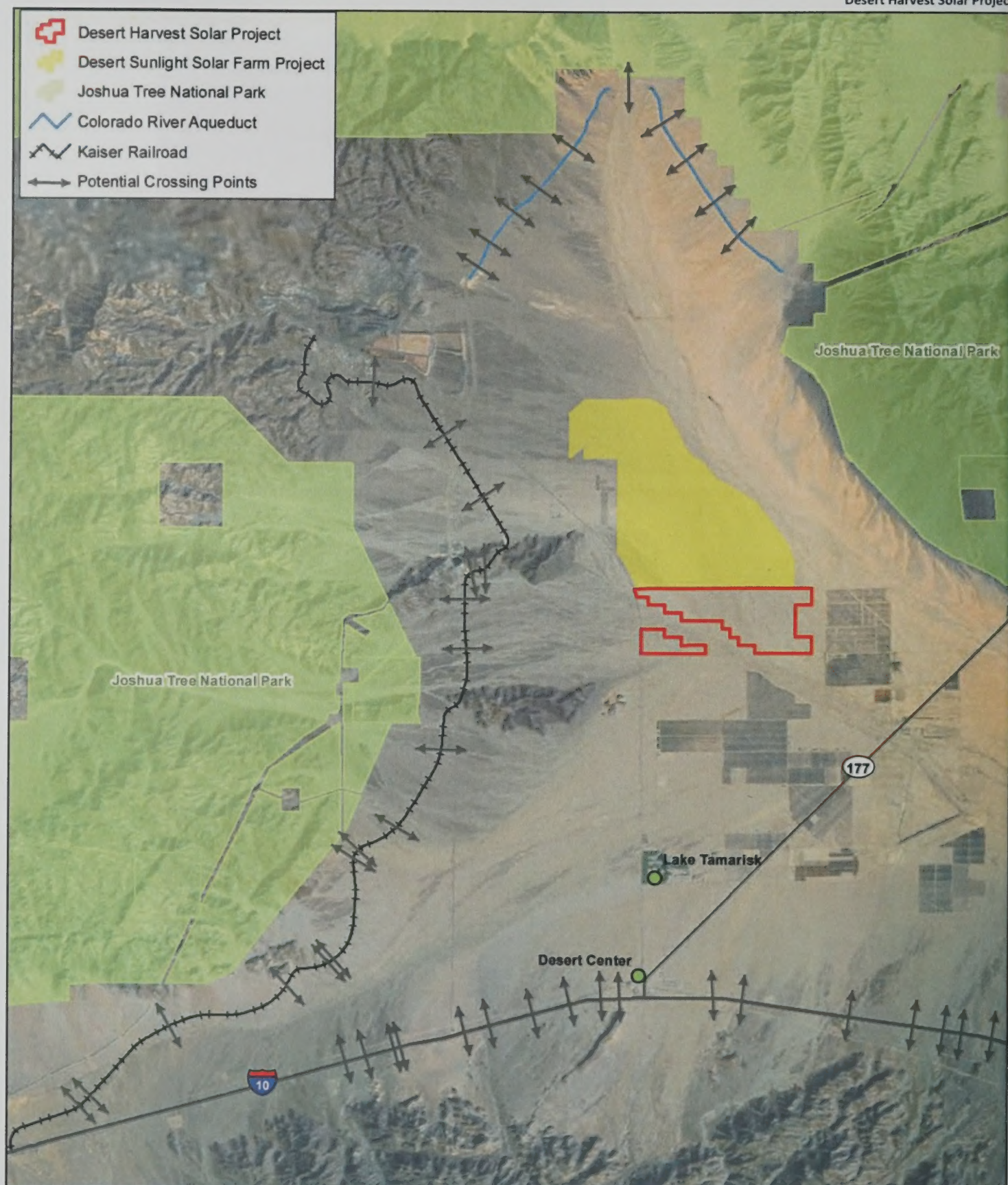
Winter Golden Eagle Survey Report



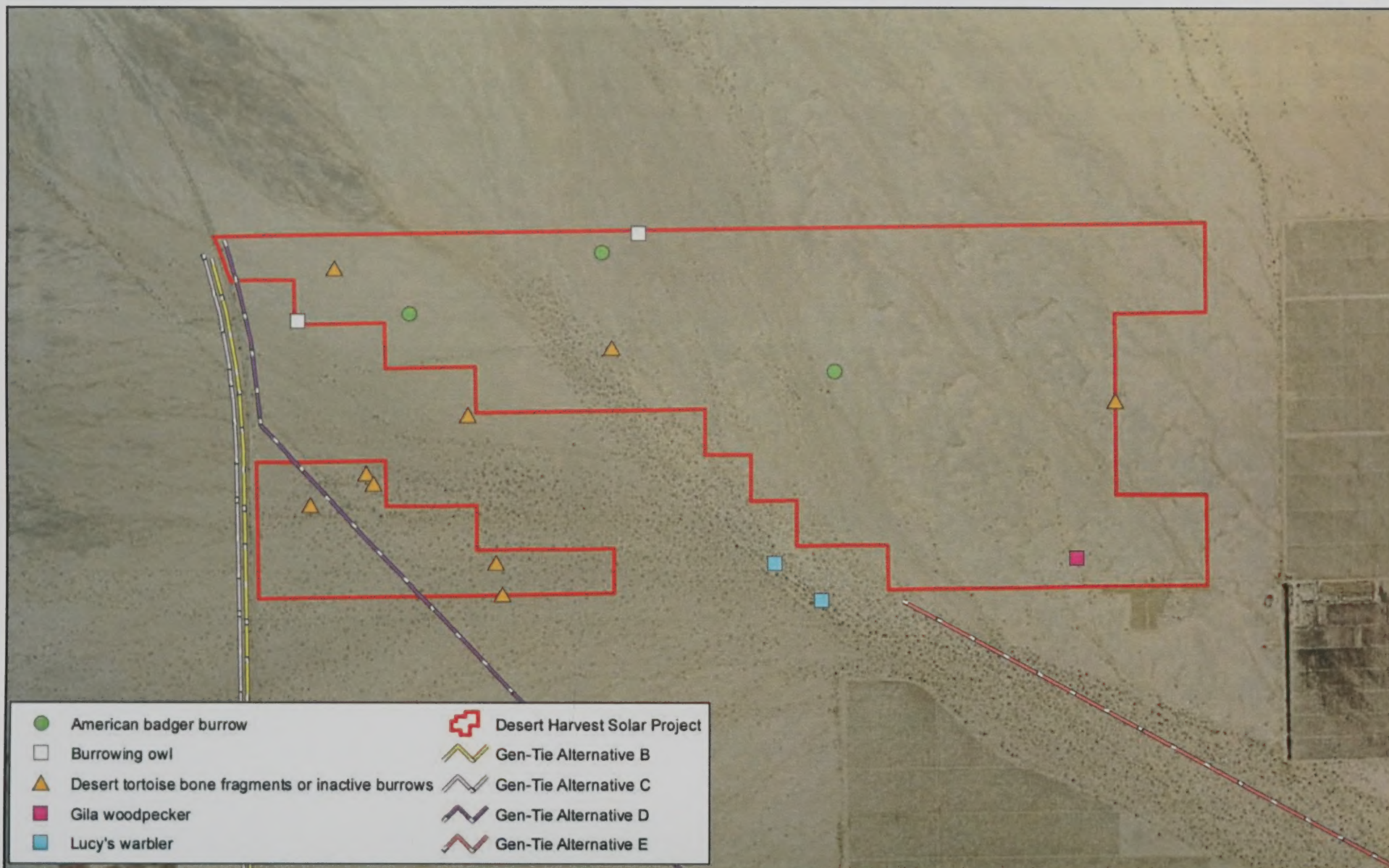
Photo 1. Typical Example of Interstate 10 stream crossing with even grade.

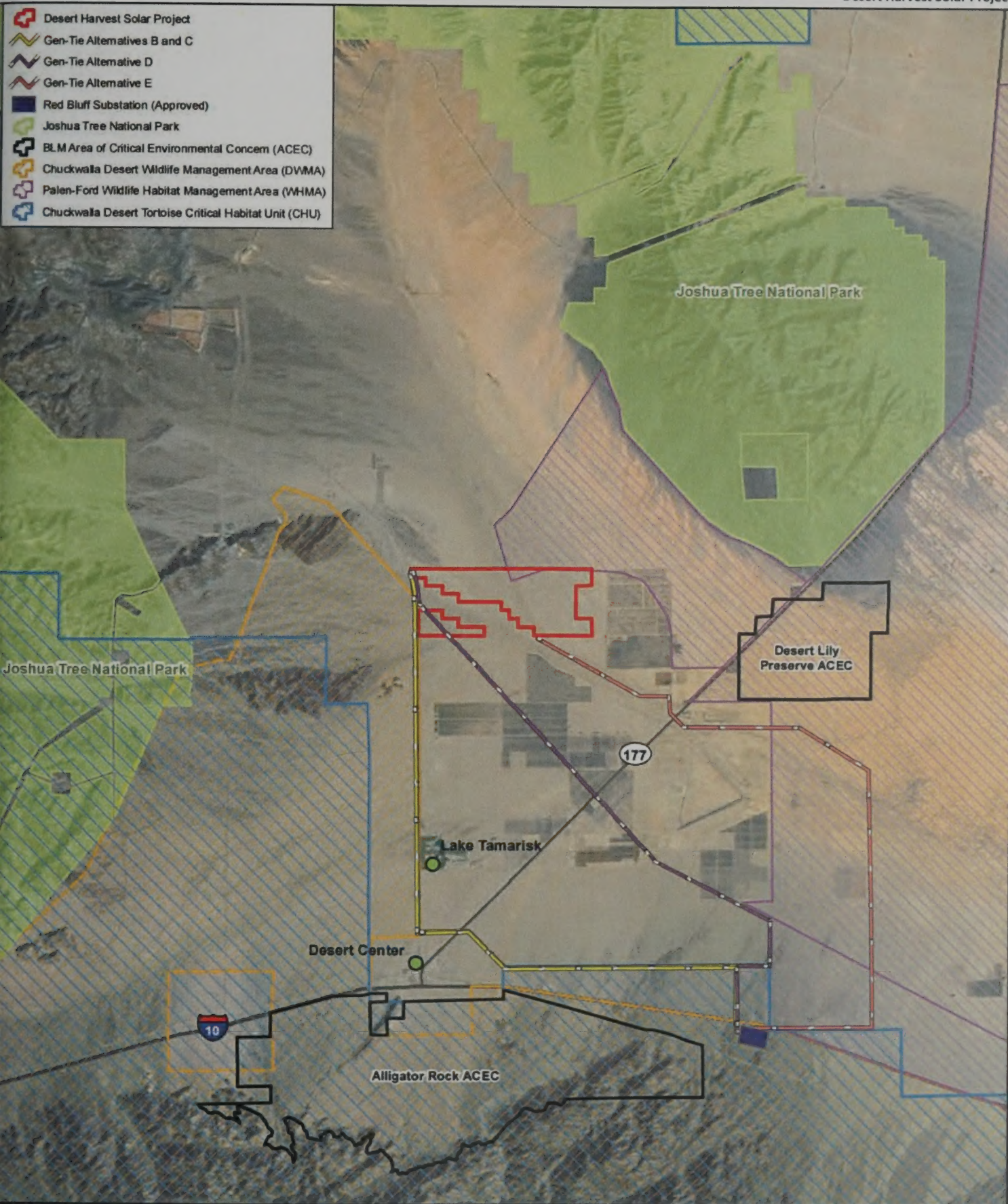


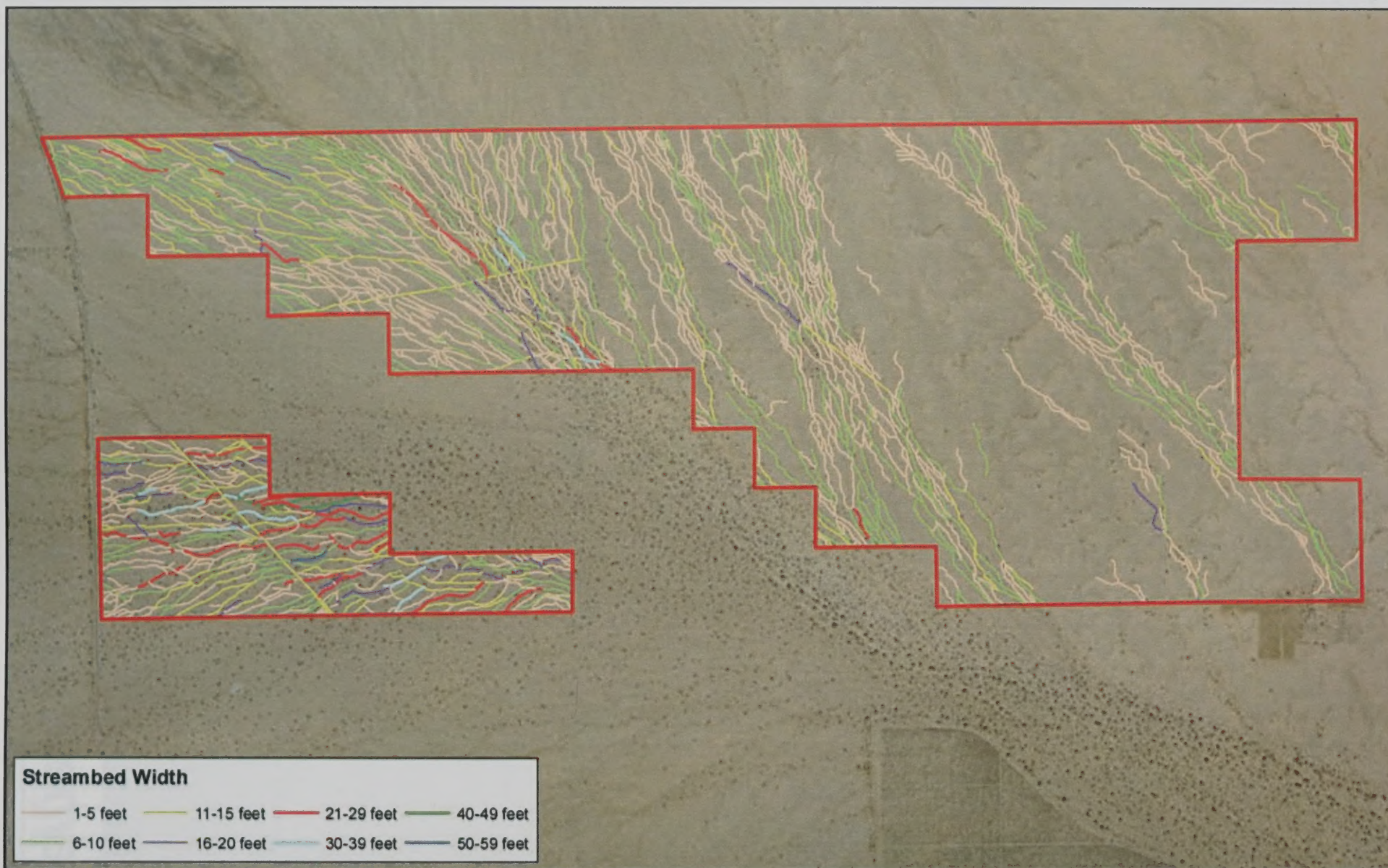
Photo 2. Typical example of Interstate 10 box culvert crossing, with uneven grade and rock armoring downstream side of each culvert.











 Desert Harvest Solar Project

0 750 1,500 3,000 Feet 

Figure 5
CDFG Jurisdictional Streambeds

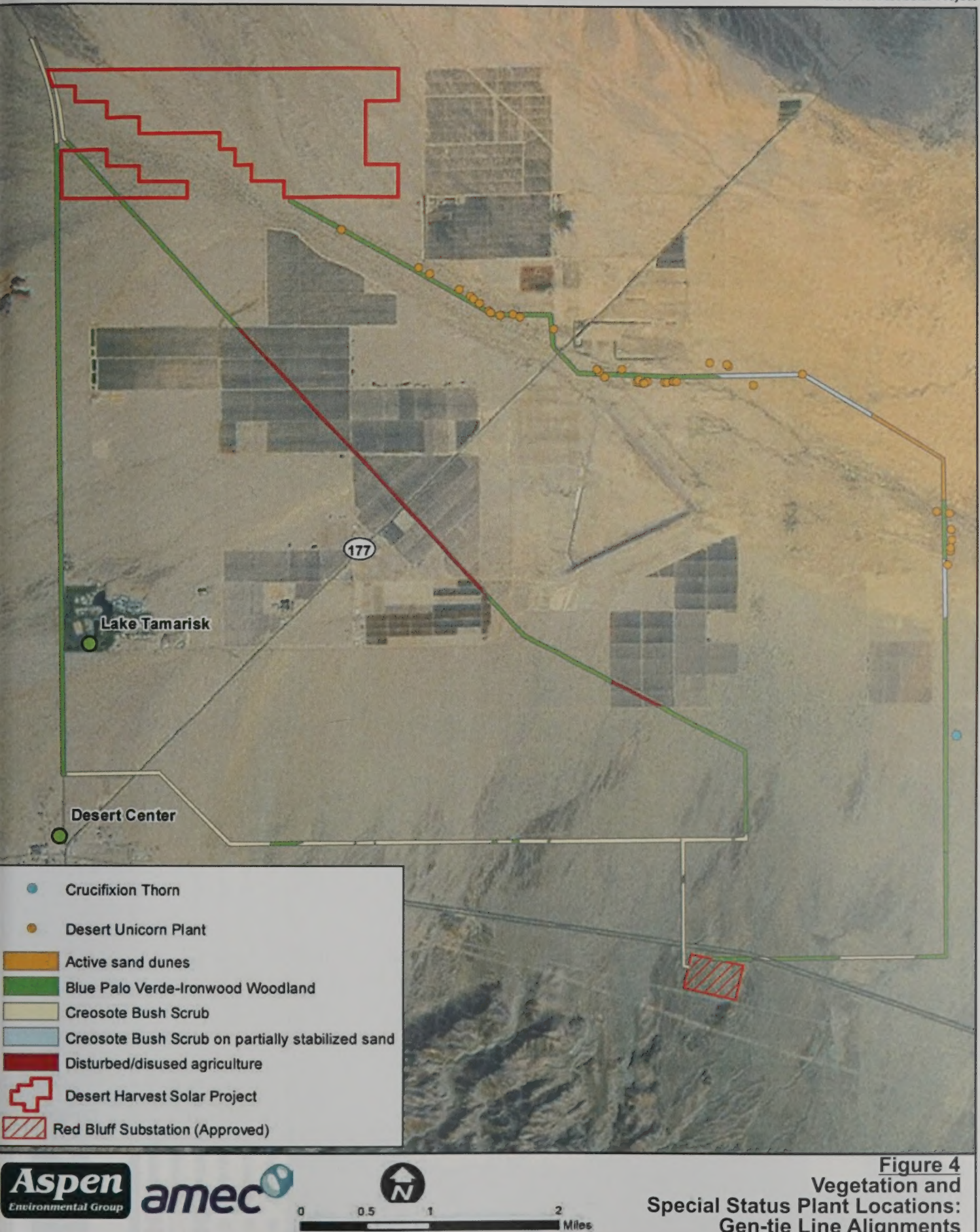
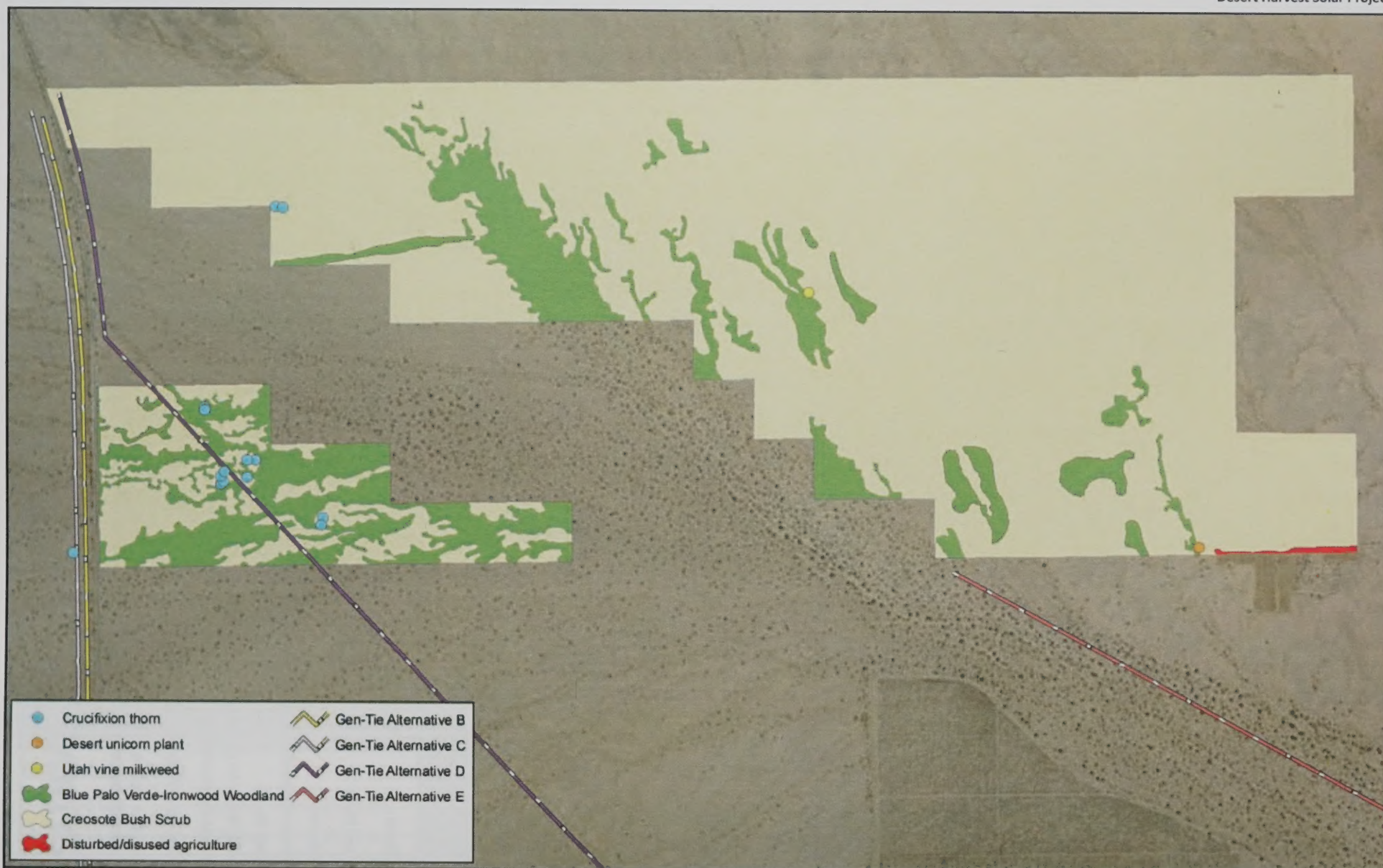


Figure 4
Vegetation and
Special Status Plant Locations:
Gen-tie Line Alignments



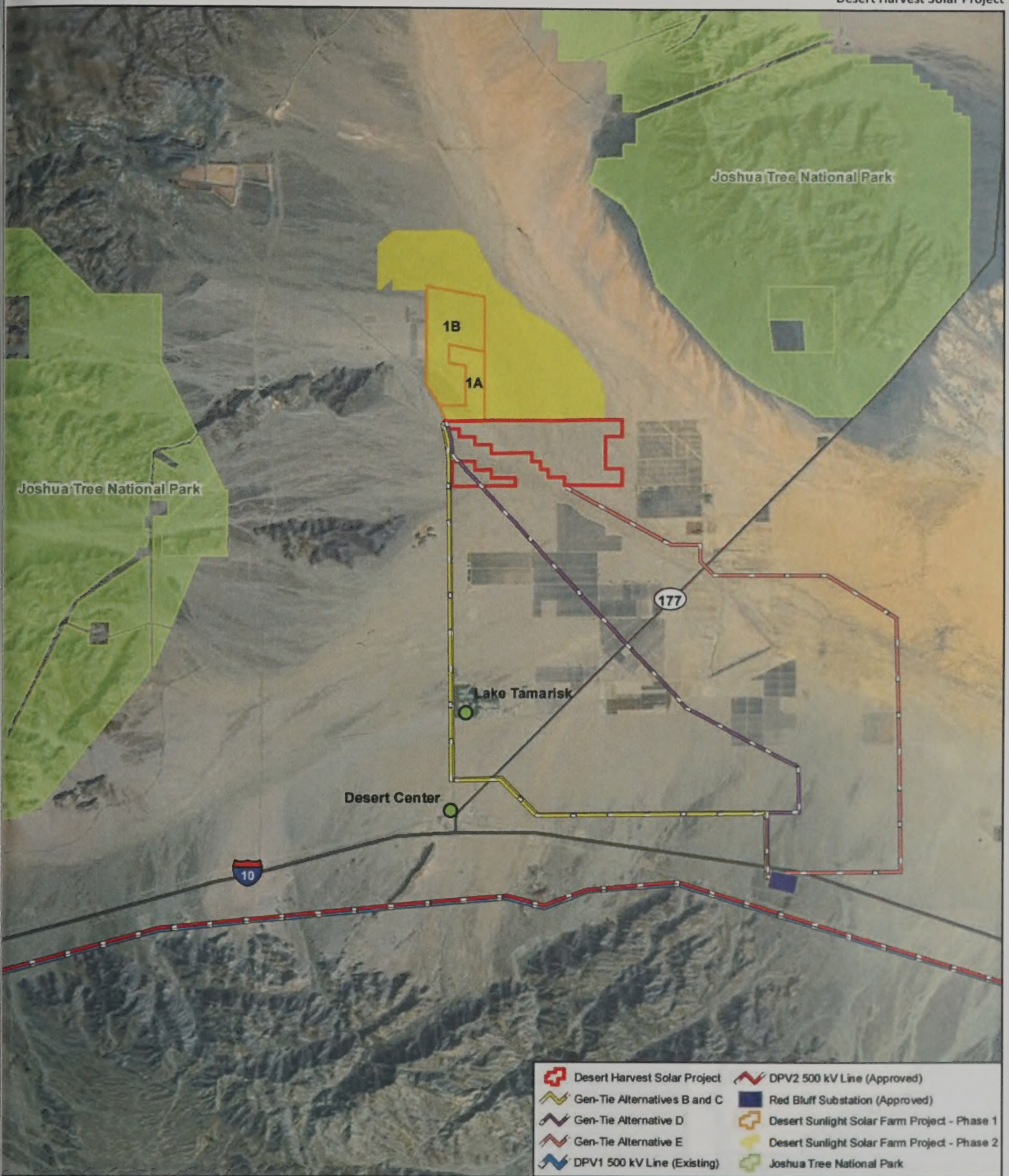


Figure 2
Project and Vicinity



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“passively relocate” the owls if they are present. Passive relocation requires under authorization from CDFG.

Some birds will likely nest in the project area during construction, even after initial grading and clearing. Depending on the species, birds may nest on the ground close to equipment; within the open metal framework of the panel support structures; on buildings, foundations, structures, or construction trailers; or on idle vehicles or construction equipment left overnight or during a long weekend. In areas where construction is phased (e.g., footings or tower structures) birds may quickly use these features as nest sites. The species most likely to nest in the project area during construction are common ravens, house finches (*Carpodacus mexicanus*), and mourning doves (*Zenaida macroura*), all of which are protected by the MBTA and Fish and Game Code §§ 3503 and 3513. Due to the high probability that birds may nest on site during construction, regular monitoring is necessary throughout the breeding season. In some cases, it may be necessary to reduce buffer areas or to remove or relocate a bird nest in coordination with the resource agencies to proceed safely with construction.

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Figure 9 indicates the locations of potential wildlife crossings along the freeway and aqueduct. Burro deer have been documented crossing similar aqueduct siphons in Arizona (Tull and Krausman 2001).

The DHSP site is located roughly midway between the three mountain ranges that surround the upper Chuckwalla Valley. Land ownership in the valley is a patchwork of public BLM lands and private lands. Many, but not all, of the private parcels are in land uses incompatible with wildlife habitat or movement. The project site is adjacent to a small (ca. 40 acre) date palm orchard near its southeastern corner; about 1 mile north of agricultural lands on about 1,000 acres; and about 0.25 mile west of another large agricultural tract, also covering about 1,000 acres. These agricultural lands would likely be passable to "corridor passage" species, such as large mammals. Disused agricultural lands may also be suitable for some "dweller" species, including small mammals and reptiles, but they are poorly suitable for desert tortoises. The site presently contributes to suitable desert tortoise movement routes from southwest to northeast, between the Chuckwalla DWMA (west of the site) and the Coxcomb Mountains.

Construction of the Desert Harvest project would exclude most terrestrial wildlife species from the site. The project's individual impacts to wildlife movement in the area would be relatively unimportant, because extensive areas of natural open space would continue to provide movement habitat around the site, especially to the east and north. However, in combination with other land uses in the Chuckwalla Valley including the recently approved Desert Sunlight project, the Desert Harvest project would contribute to the cumulative loss of wildlife movement habitat, described by the USFWS (2011b). The applicant, enXco, is working with Wildlands, Inc., a private firm specializing in habit preservation and management, to identify and acquire suitable compensation lands to mitigate the project's potential impacts to regional wildlife movement.

NATIVE BIRDS: MIGRATORY BIRD TREATY ACT / CALIFORNIA FISH AND GAME CODE

The federal Migratory Bird Treaty Act (MBTA) prohibits take of any migratory bird, including eggs or active nests, except as permitted by regulation (e.g., hunting waterfowl or upland game species). Under the MBTA, "migratory bird" is broadly defined as "any species or family of birds that live, reproduce or migrate within or across international borders at some point during their annual life cycle" and thus applies to most native bird species. California Fish and Game Code § 3503 prohibits take, possession, or needless destruction of bird nests or eggs; § 3503.5 prohibits take or possession of birds of prey or their eggs; and § 3513 prohibits take or possession of any migratory nongame bird. With the exception of a few non-native birds such as European starling, the take of any birds or loss of active bird nests or young is regulated by these statutes. Most of these species have no other special conservation status as defined above.

The entire project site and surrounding area provides suitable nesting habitat for numerous resident and migratory bird species (AMEC 2011d). Many adult birds would flee from equipment during initial vegetation clearance for project construction. However, nestlings and eggs would be vulnerable during project construction. If initial site grading or brush removal were to occur during nesting season, then it likely would destroy bird nests, including eggs or nestling birds. For most birds, these impacts can be avoided by scheduling initial clearing and grading outside the nesting season. Or, if initial clearing and grading are undertaken during nesting season, work may be limited only to areas where no nesting birds are present, as documented by pre-construction nest surveys. One special-status species, the burrowing owl, is unlikely to flee the site during construction even outside the nesting season, due to its characteristic behavior of taking cover in burrows. Avoidance of burrowing owls during initial clearing and grading necessitates pre-construction surveys for active burrows, and follow-up measures to

larger habitat blocks; for these species, movement among mountain ranges may take place over the course of several generations (Beier and Loe 1992). The USFWS (2011b) recommends maintaining large areas of occupied desert tortoise habitat in important linkage areas, including the upper Chuckwalla Valley. Within these linkage areas, desert tortoises should be “dweller” species.

A state-wide evaluation of habitat connectivity (Spencer et al. 2010) includes the upper Chuckwalla Valley, including the project area, among areas identified as “Essential Connectivity Areas.” The report describes these as follows: “Essential Connectivity Areas are placeholder polygons that can inform land-planning efforts, but that should eventually be replaced by more detailed Linkage Designs, developed at finer resolution based on the needs of particular species and ecological processes” (p. xiii). Spencer et al. (2010) recommend siting renewable energy projects in the Sonoran Desert region where they will not block potential wildlife movement corridors, and make several other recommendations related to roadway crossings and fencing (p. 69). In Chapters 4 and 5, Spencer et al. (2010) provide “frameworks” for regional and local scale connectivity analysis. Within the Chuckwalla Valley, these regional and local analyses have not been completed.

BLM management strategies for wildlife and habitat, including management to maintain connectivity among habitat areas, include special management of Areas of Critical Environmental Concern (ACECs), Wilderness Areas, Wilderness Study Areas, Wildlife Habitat Management Areas (WHMAs) and Desert Wildlife Management Areas (DWMAs). Certain BLM lands within the Chuckwalla Valley and near the Project area are designated as ACECs, WHMAs, and DWMAs (Figure 6). Extensive natural habitat areas within JTNP, north of the project site, are also important to regional wildlife habitat connectivity.

The Chuckwalla Valley is bordered on the south by the Chuckwalla Mountains, south of the I-10; and on the north by the Eagle Mountains and Coxcomb Mountains, both within JTNP, north of the Colorado River Aqueduct (Figure 9). Opportunity for wildlife movement among these mountain ranges is significantly impeded by the I-10 Freeway and the aqueduct. A few other existing linear features (paved roads, the disused Kaiser rail line, unpaved roads, transmission line and pipeline access roads parallel to the freeway) but have only minimal effects on wildlife movement for some species, but may be partial barriers for others. Non-linear impediments to wildlife movement include residential land uses around Lake Tamarisk and Eagle Mountain; the closed Eagle Mountain quarry and associated overburden deposits, evaporation ponds, and other facilities, and the active and disused agricultural lands throughout the valley.

Some species, such as coyote, may learn to cross the freeway safely. But for most terrestrial species the freeway presents an impassable or high risk barrier to north-south movement (evident by the road-killed desert tortoise observed on the Eagle Mountain Road off ramp of the I-10 in 2010). There are potential wildlife crossings beneath the freeway at scattered wash crossings (e.g., box culverts) and at the underpasses at Desert Center Road and Eagle Mountain Road. These crossings are accessible to many terrestrial wildlife species, but many of the box culverts are inaccessible to small animals, probably including desert tortoises, due to vertical steps of about 2 feet on the downstream ends of the culverts (see Photo Exhibits). Also, while the crossings are large enough for physical access to any species, specific behavioral adaptations affect the likelihood that any given species would use them. Mountain lions or coyotes would likely cross through the culverts routinely, but deer and bighorn sheep may avoid them if they perceive the culverts as too confining for escape.

The portion of the aqueduct where water flows in an uncovered surface canal (i.e., through the northern part of the Chuckwalla Valley, near the JTNP boundary) presents an impassable barrier, except at periodic “siphon” points, where desert washes cross over the aqueduct. At these crossings, aqueduct water is carried underground through U-shaped siphons over distances of several hundred feet or more.

scrub-jay habitat is found in the project area. Other potential impacts to these species would be similar to those discussed below, under the MBTA.

Wide-ranging mammals: Several mammal species range widely through desert habitats, either among partially isolated mountain ranges (e.g., Nelson's bighorn sheep, above) or more often in valleys. These include Yuma mountain lion (*Felis concolor browni*), burro deer, or desert mule deer (*Odocoileus hemionus eremicus* [= *O. h. crooki*]), American badger (*Taxidea taxus*) and desert kit fox (*Vulpes macrotis arsipus*). Desert kit fox is not listed as a special-status species by CDFG or USFWS, but it is protected under the California Code of Regulations (Title 14, § 460).

DHSP occurrence or effects: Sign of American badger and desert kit fox were located on the site during field surveys for desert tortoise and other resources. Ungulate tracks, from either Nelson's bighorn sheep or desert mule deer, were observed on the site during the streambed delineation work. The project would eliminate approximately 1,208 acres of habitat that is suitable for each of these species, though used only rarely by Nelson's bighorn sheep, Yuma mountain lion, or desert mule deer.

WILDLIFE MOVEMENT

The extent, distribution, and accessibility of suitable habitat affect the long-term viability of regional wildlife populations. Fragmentation and isolation of natural habitat ultimately results in the loss of vulnerable native species within those areas (Soulé et al. 1988). Accessibility among habitat areas, i.e., "connectivity," is important to long-term genetic diversity and demography of wildlife populations. In the short term, it may also be important to individual animals' ability to occupy their home ranges, if their ranges extend across a potential movement barrier. These considerations are especially important for rare, threatened, or endangered species such as the desert tortoise, and wide-ranging species which exist in low population densities such as large mammals. Therefore, this discussion of potential project impacts to wildlife movement focuses on desert tortoise and Nelson's bighorn sheep. However, these conditions are also relevant for other species, including corridor "passage" and corridor "dweller" species (Beier and Loe 1992). Corridor passage species would traverse connectivity areas during ordinary diurnal or seasonal movement patterns, whereas corridor dweller species must persist as viable populations over multiple generations within a connectivity area in order to eventually migrate from one habitat block to another. The upper Chuckwalla Valley, where the Desert Harvest site is located, appears to be an important linkage between desert tortoise populations in the Colorado and Mojave deserts (USFWS 2011b).

In landscapes where native habitats exist as partially isolated patches surrounded by other land uses, planning for wildlife movement generally focuses on "wildlife corridors" to provide animals with access routes among habitat patches. In largely undeveloped areas, including the Chuckwalla Valley, wildlife habitat is available in extensive open space areas throughout much of the region, but specific barriers may impede or prevent movement. In these landscapes, wildlife movement planning focuses on specific sites where animals can cross linear barriers (e.g., wash crossings beneath the I-10 freeway), and on broader linkage areas which may support stable, long-term populations of target species.

In the Chuckwalla Valley, the biologically important functions of large mammal movement are the long-term demographic and genetic effects of occasional animal movement among mountain ranges and other large habitat areas. Animals such as Nelson's bighorn sheep may travel across the valley infrequently, as a part of dispersal among subpopulations. Animals may also use bajada habitat, including habitat on the project site, for seasonal foraging, as part of its regular home range. These large animals are example of corridor "passage" species. In contrast to large animal movement, desert tortoises and other less-mobile animals may live out their entire lives within a linkage area between

southward to the coast in San Diego County and Baja California. In the deserts, rosy boas range throughout most of the Mojave Desert and much of the Colorado Desert, eastward into Arizona. They are active during warm seasons, and are primarily nocturnal. The CDFG Natural Diversity Data Base considers rosy boa a “special animal” but it has no formal status under state or federal Endangered Species Acts.

DHSP occurrence or effects: Habitat at the Desert Harvest project site may be marginally suitable for rosy boa, but lacks the boulders or rock crevices of their primary habitat. The site is within their geographic range and could be occupied at low density.

Raptors: In addition to raptors discussed above, several other special-status birds of prey are found seasonally, especially during winter, in the region. These include osprey (*Pandion haliaetus*), ferruginous hawk (*Buteo regalis*), Cooper’s hawk (*Accipiter cooperii*), sharp-shinned hawk (*A. striatus*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), merlin (*F. columbaris*), short-eared owl (*Asio flammeus*), and long-eared owl (*A. otus*) (Table 4). Osprey and sharp-shinned hawk were observed flying over the site during winter season point count surveys, but neither species would nest in the area (AMEC 2011d). Outside their breeding seasons, these raptors need not return to their nests to feed young or tend eggs. Thus, they are able to forage over wide areas, where they capture birds or small mammals. Suitable winter or migratory season foraging habitat for all of these raptors is widely available throughout the region.

DHSP occurrence or effects: Potential project impacts to these species and their foraging habitat would be comparable to those discussed above for wintering golden eagles. In summary, project construction would eliminate 1,208 acres of suitable foraging habitat, cause increased noise and disturbance to adjacent habitat, and may present collision or electrocution hazards, such as the gen-tie line and other project facilities.

Upland perching birds: Several upland perching bird species are included in the CDFG Special Animals compilation. These include loggerhead shrike (*Lanius ludovicianus*), Bendire’s thrasher (*Toxostoma bendirei*) LeConte’s thrasher (*T. lecontei*), Crissal thrasher (*T. crissale*), the Eagle Mountains scrub-jay population (*Aphelocoma californica cana*), and vermilion flycatcher (*Pyrocephalus rubinus*). In addition, a Vaux’s swift (*Chaetura vauxi*) was observed over the site during migration season (AMEC 2011); this species occurs in the area only during migration; it nests well to the north, and project development would be unlikely to affect Vaux’s swift.

DHSP occurrence or effects: Loggerhead shrikes were observed on the site routinely throughout the winter and breeding season avian point count surveys (AMEC 2011d). Neither LeConte’s thrasher nor Crissal thrasher have been reported on-site, but habitat is suitable and either species could occur there. Project development would eliminate 1,208 acres of suitable habitat for these species at the solar generator site, and would also affect smaller areas of suitable habitat along gen-tie alignments. Vermilion flycatchers have not been reported on-site, but nest in similar habitat to the south (AMEC 2011d) and could nest in ironwood woodlands on-site in future years. Project development would eliminate 180 acres of suitable desert woodland habitat at the solar generator site, and would also affect smaller areas of suitable habitat along gen-tie alignments. The Eagle Mountains scrub-jay population resides year-around in pinyon woodlands in the Eagle Mountains. It is disjunct from other scrub-jay populations, and is on CDFG’s “watch list” but has no other special conservation status. A scrub-jay was observed on the project site in October 2011; presumably, it was wandering or dispersing from habitat in the Eagle Mountains. However, this bird could have come from much farther away. Scrub-jays of the Great Basin population and can wander considerable distances. However, no suitable

daily (day roosts, used during inactive daylight hours). Maternity roosts are particularly important overall for bat life histories. Knowledge of bat distributions and occurrences is sparse. The majority of adverse impacts to bat populations in the region result from disturbance of roosting or hibernation sites, especially where large numbers of bats congregate; physical closures of old mine shafts, which eliminates roosting habitat; elimination of riparian or desert wash microphyll vegetation which is often productive foraging habitat; more general habitat loss or land use conversion; and agricultural pesticide use which may poison bats or eliminate their prey-base (Pierson & Rainey 1998; Gannon 2003). Bat life histories vary widely. Some species hibernate during winter, or migrate south. During the breeding season, bats generally roost during the day, either alone or in communal roost sites, depending on species. All special-status regional bats are insectivorous, catching their prey either on the wing or on the ground. Some species feed mainly over open water where insect production is especially high, but others forage over open shrublands such as found on the project site.

DHSP occurrence or effects: Project development is unlikely to affect special-status bat roost sites, but would eliminate 1208 acres of desert shrubland foraging habitat, including 180 acres of productive dry desert wash foraging habitat, and would also affect smaller areas of suitable foraging habitat along gen-tie alignments.

Palm Springs round-tailed ground-squirrel (*Xerospermophilus tereticaudus chlorus*): Palm Springs round-tailed ground squirrel (also called Coachella Valley round-tailed ground squirrel) is a California Species of Special Concern, on the BLM Sensitive Species list, and was a candidate for federal listing as threatened or endangered prior to 2010, when it was removed from the list of candidates (USFWS 2010). Until recently, it was believed to be limited in range to the Coachella Valley region. Within that area, its primary habitat is mesquite (*Prosopis glandulosa*) hummocks and associated sand dunes and, to a lesser extent, dunes and hummocks associated with creosote bush or other vegetation. The primary threats to its habitat are land use changes and groundwater pumping, both of which have eliminated much of the honey mesquite from the Coachella Valley area. Recent research indicates that its range is substantially larger than previously understood, extending at least 150 miles northward to Hinkley Valley and Death Valley. Based on this range extension; the protected habitat in Death Valley National Park; and ongoing conservation efforts in the Coachella Valley, the USFWS concludes that it no longer warrants candidate status. The expanded understanding of Palm Springs round-tailed ground-squirrel's geographic range also seems to indicate that it uses a broader range of habitat than previously understood.

DHSP occurrence or effects: Palm Springs round-tailed ground squirrel was reported near the proposed gen-tie line in the Desert Sunlight EIS (BLM 2011) and on the DHSP site during AMEC's field surveys (2011d). Habitat in that area lacks the aeolian sands and mesquite hummocks that characterize its primary habitat as previously understood (see text under Mojave fringe-toed lizard, above). Palm Springs round-tailed ground squirrel appears to occur throughout the area though, but no mesquite or dune habitat would be affected by the project.

Other Special-Status Wildlife Species

In addition to the statutes and policies described above, several public agencies and private entities maintain lists of wildlife species animals of conservation concern. The CDFG compiles these in its compendium of and "Special Animals." These species are treated here as "special-status species."

Rosy boa (*Charina trivirgata*): The rosy boa occurs in rocky shrublands from sea level to about 6700 feet elevation. In the coastal regions, it is found south and west of the major mountain chains, in the interior valleys and mountains of Los Angeles, Riverside, San Bernardino, and Orange counties,

suitability, due to relatively low cover of *Yucca* and *Opuntia* species, and seemingly poorly-suitable soil texture. There is a low to moderate probability that Bendire's thrasher may occur on the site.

Lucy's warbler (*Vermivora luciae*): Lucy's warbler is a migratory songbird that breeds in desert riparian woodlands and winters on Pacific Coast of mainland Mexico. Its breeding range extends through much of Arizona, and parts of the eastern California deserts. It is a cavity-nesting species (i.e., it generally nests in unoccupied woodpecker nests or other cavities in trees). Its primary nesting habitat is mesquite thickets, but also uses native riparian trees and saltcedar (*Tamarix* spp.).

DHSP occurrence or effects: Two singing male Lucy's warblers were reported in April 2011 near the southwestern corner of the project area (AMEC 2011). These birds were not observed later during the nesting season point counts (28 April survey date), but no focused surveys were conducted. It is unknown whether either or both of these birds successfully established breeding territories in the area, or moved on to another site. Suitable nesting cavities may be available in large blue palo verde trees on the site, but probably not in the more dominant desert ironwood trees (see Gila woodpecker discussion, above). The nests of Lucy's warblers are sometimes placed behind loose bark, so there is some potential for them to nest in ironwood trees. Lucy's warblers may nest in desert wash woodlands on or near the proposed solar facility site or gen-tie alignment alternatives.

Project development would eliminate up to 180 acres of potential nesting and foraging habitat for Lucy's warbler on the proposed solar generator site, and could also affect smaller areas of suitable habitat along gen-tie alignments. In addition to habitat impacts, the project could cause mortality or injury to a Lucy's warbler (including juvenile birds or eggs), if an active nest were damaged or disturbed during construction or other phases of the project. Potential project impacts would be comparable to those described for nesting birds, below.

Nelson's bighorn sheep (*Ovis canadensis nelsoni*): Nelson's bighorn sheep are known from the Transverse Ranges, California Desert Ranges, Nevada, northern Arizona, and Utah. Its populations in the Peninsular Ranges (the Santa Rosa and San Jacinto Mountains, and southward into Baja California) are federally listed as a threatened distinct vertebrate population segment. However, populations in eastern Riverside County have no CESA or ESA listing status. It is a BLM Sensitive Species and, except where designated otherwise by CDFG, is fully protected under the state Fish and Game Code. Threats to Nelson's bighorn sheep include habitat loss or degradation; limited availability of water sources; barriers to local or regional movement (e.g., highways and aqueducts); disease spread by domestic livestock; and natural predation by mountain lions in some populations.

DHSP occurrence or effects: Habitat in the desert mountain ranges surrounding the upper Chuckwalla Valley is occupied by Nelson's bighorn sheep, and they occasionally use the valley floor habitat. Ungulate tracks, from either Nelson's bighorn sheep or burro deer, were observed on the site during the streambed delineation work. Project construction would not cause habitat degradation in the mountains, though construction could cause noise and human disturbance as described above for golden eagle nesting territories. Bighorn sheep tend to acclimate to these activities in areas where such disturbances occur routinely (e.g., quarries; Jansen et al. 2009). Due to the project's location on the valley floor near sites with comparable land uses and human activity patterns, the project is not likely to affect bighorn sheep behavior or habitat use to any large extent. However, the project could affect bighorn sheep movement among the mountain ranges (see Wildlife Movement, below).

Bats: The BLM includes several bat species on its list of sensitive species. The special status bats of the local area roost in rock crevices, tunnels, or caves; one species (western yellow bat, *Lasiurus xanthinus*) roosts in the foliage of riparian trees. Roost sites may be used seasonally (e.g., inactive cool seasons) or

generator site and gen-tie Alternatives B, C, or D) would not substantially affect Mojave fringe-toed lizard or aeolian sand transport in the Chuckwalla Valley.

Burrowing owl (*Athene cunicularia*): The burrowing owl is a BLM Sensitive Species and a CDFG Species of Special Concern. As a native bird, it is also protected by the federal Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code (below). It is a small, terrestrial owl of open country. During breeding season, it ranges throughout most of the western US. It occurs year-around in southern California, but may be more numerous during fall and winter, when migratory individuals from farther north join the regional resident population. Burrowing owls favor flat, open annual or perennial grassland or gentle slopes and sparse shrub or tree cover. They use the burrows of ground squirrels and other rodents for shelter and nesting. Availability of suitable burrows is an important habitat component. Where ground squirrel burrows are not available, the owls may use alternate burrow sites or man-made features (such as drain pipes or debris piles). In the California deserts, burrowing owls generally occur in low numbers in scattered populations, but they can be found in much higher densities near agricultural lands where rodent and insect prey tend to be more abundant (Wilkerson and Siegel 2011). Burrowing owl nesting season, as recognized by the California Burrowing Owl Consortium (CBOC 1993), is 1 February through 31 August.

DHSP occurrence or effects: During the desert tortoise surveys for the Desert Harvest project site (above), AMEC field biologists examined all suitable burrows for sign of burrowing owls. These field surveys correspond to 100 percent coverage Phase II surveys for burrowing owls, recommended by the CBOC protocol (1993). No burrowing owls or their sign were observed during these spring season surveys, or during the winter and breeding season avian point count surveys. Due to the absence of burrowing owl sign, further focused burrowing owl surveys (i.e., Phase III surveys, per. CBOC) were not conducted for this project. However, two incidental burrowing owl observations were made by Aspen biologists during streambed delineation field work. In one observation, a burrowing owl was briefly seen perching and flying, but was not at a burrow. The other observation was a burrowing owl seen in the mouth of an inactive desert kit fox burrow; no burrowing owl sign (e.g., whitewash, prey remains, or owl pellets) was found at the site. Based on these field surveys and incidental observations, we conclude that the site is suitable habitat for burrowing owls during winter or breeding seasons. Breeding burrowing owls were not observed on the site during the surveys, but they could nest on the site in future years. During fall and winter, the site appears to serve as low-density seasonal burrowing owl habitat.

Bendire's thrasher (*Toxostoma bendirei*): Bendire's thrasher is a BLM Sensitive Species and CDFG Species of Special Concern. It is also protected under the federal MBTA and California Fish and Game Code, described further below. California populations are migratory, though it is found year-around in more southern portions of its range, in southern Arizona and adjacent Mexico. The Desert Harvest site is near the southern boundary of its breeding range in California. It breeds in open, upland desert shrublands of JTNP and surrounding area, and northward through several disjunct regions of the Mojave Desert (Sterling 2008). Its habitat requirements are poorly understood, but it is generally associated with *Yucca* (e.g., Joshua tree) and *Opuntia* (cholla cacti, also classified as *Cylindropuntia*) species on gently sloping terrain. Soil texture is apparently important to habitat suitability, perhaps because Bendire's thrashers largely forage on ground-dwelling insects. Hard rocky soils (e.g., desert pavement) and loose sands (e.g., dry wash sands) are apparently less suitable than firmly packed, fine-textured soils.

DHSP occurrence or effects: Bendire's thrashers were not observed on the project site during the winter or breeding-season point-count surveys. Habitat throughout the site appears to be of marginal

(*Phrynosoma mcallii*) is a special-status species of similar habitats, but its geographic range is also well south of the Desert Harvest site.

The Mojave fringe-toed lizard is primarily insectivorous. It hibernates during winter, and emerges from hibernacula in March or April. During April and May, while temperatures are relatively cool, it is active during mid-day; during summer, it is active in mornings and late afternoon, but seeks cover during the hottest parts of the day.

The Mojave fringe-toed lizard is primarily found in fine, loose, aeolian (windblown) sand habitat (Turner et al. 1984; Jennings and Hayes 1994; Stebbins 1944). Availability of soft sand is an essential habitat component, though the lizards will also use other substrates surrounding aeolian sands. Mojave fringe-toed lizards burrow in the sand to avoid predators and to thermoregulate (Stebbins 1944), and lay their eggs in sand. Sand dunes are its primary habitat, although it also uses sands and surrounding habitats at the margins of dry lakebeds, washes, and isolated blowsand pockets against hillsides (BLM and CDFG 2002), and mixed habitat such as hummocks or pockets of soft sand interspersed with hard-packed sand (Cablak and Heaton 2002).

The Mojave fringe-toed lizard is widespread in the Mojave and northern Colorado deserts, but its distribution is patchy, reflecting the patchy distribution of suitable habitat (Murphy et al. 2006). Some localized populations consist of only a few animals in small, isolated habitat patches. This fragmented distribution leaves local populations vulnerable to extirpation from habitat disturbance, further fragmentation, or stochastic events (Murphy et al. 2006). Aeolian sand habitat is vulnerable to direct and indirect disturbances (Weaver 1981; Beatley 1994; Barrows 1996). Environmental changes that stabilize sand, affect sand sources, or block sand movement corridors will, in turn, affect Mojave fringe-toed lizard habitat and populations (Turner et al. 1984; Jennings and Hayes 1994). Threats to Mojave fringe-toed lizards and their habitat include habitat loss or damage from urban and agricultural development, vehicles, and indirect effects such as invasive weeds and increased habitat access by common ravens or other predators. Another important indirect disturbance is the potential disruption of sand source for the dune systems. Dune habitat that is cut off from its sand source will degrade over time as finer sands are blown away, leaving behind smaller dunes composed of coarser-textured sand.

DHSP occurrence or effects: Based on a habitat evaluation by Robert Black (2011), the DHSP site does not appear to provide suitable habitat for Mojave fringe-toed lizard. Ephemeral washes and channels throughout the proposed solar generator site provide patchy alluvial sand habitats but the sand was often cemented or compacted, and the sand depth and coarse texture were poorly suitable for Mojave fringe-toed lizard. The few isolated areas where deeper, loose sand was present were not large enough to support Mojave fringe-toed lizard.

Mojave fringe-toed lizards occur in aeolian sand habitat at the base the Coxcomb Mountains, east of Pinto Wash, about 1 mile northeast of the Desert Harvest project site. Aeolian sand in this area is within a sand transport corridor, originating upslope in JTNP, and continuing southeast to the Palen Dunes. The Desert Harvest project site is outside that sand transport corridor. The site is immediately downslope and downwind from the approved Desert Sunlight project area, now under construction. Environmental analysis of the Desert Sunlight project (BLM 2011) concluded that the site was not within the sand transport corridor, and that project development would not affect sand migration in the Pinto Wash / Palen Dunes corridor. However, portions of gen-tie Alternative E are within suitable habitat for Mojave fringe-toed lizard, and development of that alternative would be likely to take habitat and possibly take individual lizards. Based on our field work on the site, and on the analysis of adjacent Desert Sunlight project, we conclude that development of the other Desert Harvest project components (the solar

In addition to summer rain pools, Couch's spadefoot requires soft, sandy soils for burrowing and generally is found at the edges of arroyos or in open soil around the bases of shrubs (Grismer 2002). Adult spadefoots make seasonal movements to and from breeding pools, but movement distances are unknown for this and other spadefoot species (Morey 2005).

Couch's spadefoot is widespread in the southwestern US and Mexico. The Colorado Desert in California is at the western margin of its geographic range. Stebbins (2003) indicates that it is restricted in California to a corridor immediately adjacent to the Colorado River, though Morey (2005) indicates a much broader distribution in the California deserts. In California, Couch's spadefoot is threatened by habitat conversion for other uses. It is ranked as a Species of Special Concern by CDFG and as a Sensitive Species by BLM.

DHSP occurrence or effects: Topography and drainage channel morphology on the proposed solar generation site and along the proposed gen-tie line indicate that no suitable breeding pools would form or hold rain water long enough for spadefoot reproduction. Upland habitat may be suitable as winter dormancy/burrowing habitat, depending upon the project site's proximity to breeding pools, the species' movement distances between borrow and breeding sites, and any specific habitat requirements for burrowing sites. Project development would not be expected to impact Couch's spadefoot breeding habitat and potential impacts to winter dormancy habitat appear to be minimal, based on lack of breeding pools in the area.

Banded Gila monster (*Heloderma suspectum cinctum*): The Gila monster is rare in California, and more common in Arizona and northwestern Mexico. It is a large and distinct lizard, but is difficult to observe even in areas where its occurrence is known. As a result, little is known about its distribution, population status, and life history in California. Most historical observations in California have been in riparian areas or at moderate elevations of the higher desert mountain ranges, in rocky, incised topography (Lovich and Beaman 2007). In California, the Gila monster is apparently confined to the eastern deserts (east of 116° longitude) where summer rainfall makes up 25 percent of average annual precipitation (Lovich and Beaman 2007). There has been only one report from farther west (the Mojave River). Throughout its range, the Gila monster appears to be most active during or following summer rains.

DHSP occurrence or effects: The project site may be west of the banded Gila monster's range, and habitat on the site appears to be only marginally suitable. Project development is unlikely to affect banded Gila monster.

Mojave fringe toed lizard (*Uma scoparia*): The Mojave fringe-toed lizard is known almost exclusively from California, primarily in San Bernardino and eastern Riverside Counties (Jennings and Hayes 1994). It is a California Species of Special Concern and BLM Sensitive Species. The northern lineage, associated with the Amargosa River drainage system, is under review for federal listing as a threatened or endangered population (USFWS 2008b), but its geographic range is well north of the DHSP site. The southern lineage is more widespread, ranging through the Mojave River drainage system, Bristol Trough, Clark's Pass (including the Chuckwalla Valley, Palen Lake and Pinto Wash), and the Colorado River sand transport systems.

The Mojave fringe-toed lizard is related to two other special-status species: the Colorado Desert fringe-toed lizard (*U. notata*), a BLM Sensitive Species that is found farther to the south; and the Coachella Valley fringe-toed lizard (*U. inornata*), a federally listed threatened and state listed endangered species endemic to the Coachella Valley, west of the Desert Harvest site. In addition, the flat-tailed horned lizard

Wildlife Species Fully Protected Under the California Fish and Game Code

Under the state Fish and Game Code, selected fish and wildlife species are designated as fully protected, prohibiting take except under permit for scientific purposes. Most of the designated fully protected species occur well outside the project vicinity, but several could occur in the area. These are: golden eagle (discussed above, Species Protected under the Bald and Golden Eagle Protection Act), selected populations of Nelson's bighorn sheep (discussed below, BLM Sensitive Wildlife Species), American peregrine falcon, and ring-tailed cat.

American peregrine falcon (*Falco peregrinus*): Peregrine falcons were formerly listed under CESA and ESA, but have been delisted under both Acts. They are found irregularly in the region, generally during migratory and winter seasons. They have not been known to nest in the region in recent decades, though they did nest in desert mountain ranges near the Colorado River historically (Rosenberg et al. 1991; Patten et al. 2003). They feed primarily on birds captured during flight. Waterfowl and shorebirds make up a large proportion of their prey, and nest sites are often within foraging range of large water bodies.

DHSP occurrence or effects: Project implementation would not affect nesting habitat and has little likelihood of adversely affecting foraging behavior.

Ring-tailed cat (*Bassariscus astutus*): The ring-tailed cat, or ringtail (it is unrelated to true cats), occurs throughout much of California and southwestern North America, in many habitat types, including forests, woodlands, and deserts. In deserts, it generally is found in steep or rocky terrain, and uses rock piles and bedrock crevices for shelter. It also dens in burrows, tree cavities, or brush piles (Wilson and Ruff 1999).

DHSP occurrence or effects: Habitat in the regional mountain ranges is suitable for ringtail, though habitat on the project site appears to be poorly suitable due to lack of suitable den sites and relatively low cover or shelter availability. The project is unlikely to cause take or other adverse impacts to ringtails.

BLM Sensitive Wildlife Species

The BLM maintains a list of Sensitive Wildlife Species, including species that are rare, declining, or dependent on specialized habitats (BLM 2010b). It manages sensitive species to provide protections comparable to species that may become listed as threatened or endangered (i.e., candidate species for federal listing). In addition to species addressed in this section of the BRTR, all listed threatened or endangered species (above) are managed as BLM sensitive species.

Couch's spadefoot (*Scaphiopus couchi*): Couch's spadefoot, like other spadefoot species, is an amphibian with appearance and life history characteristics similar to the true toads (*Bufo* spp.) but distinguished from that genus by several characteristics, especially the thickened sharp-edged "spades" on the hind feet, used for burrowing (Stebbins 2003). Couch's spadefoot is almost entirely terrestrial. It is dormant in burrows 20 to 90 cm deep for 8 to 10 months of the year (Jennings and Hayes 1994). It is active on the surface only during periods following warm summer rains, when it emerges to feed on insects and to reproduce. Successful reproduction requires warm rain pools which must hold water long enough to allow the eggs hatch and the tadpoles to develop, and then metamorphose into juvenile spadefoots. This has been reported to occur in as few as 7 to 10 days (Jennings and Hayes 1994; Grismer 2002), one of the fastest rates of metamorphosis among the frogs and toads.

Threats to golden eagles include illegal shooting, power line electrocution, wind turbine strikes, and rodenticides (used for rodent control, and secondarily ingested by eagles feeding on target pest species). They also are affected by habitat loss or degradation due to land use changes such as urbanization and agriculture. The golden eagle population is estimated at approximately 30,000 in the western U.S., down from an estimated 100,000 in the late 1970s. Survey data from 2003 and 2006 to 2008 indicate a decline of 26 percent since 2003 (USFWS 2009a).

Golden eagle foraging habitat consists of open terrain such as grasslands, deserts, savanna, and early successional forest and shrubland habitats, throughout the regional foothills, mountains, and deserts. They prey primarily on rabbits and rodents but will also take other mammals, birds, reptiles, and some carrion (Kochert et al. 2002).

Absent interference from humans, the densities of breeding golden eagle territories is limited by either prey density or nest site availability (USFWS 2009a). Breeding season home range sizes vary widely. For example, in San Diego County, a study of 27 nesting pairs found breeding ranges to average 36 square miles with a range from 19 to 59 square miles (Johnsgard 1990). Eagles and other raptors forage more widely outside of the nesting season, since they have no need to return daily to eggs or young at their nests.

DHSP occurrence or effects: The mountain ranges surrounding the project site provide suitable golden eagle nesting and foraging habitat. Inactive golden eagle nests have been documented to the northwest, northeast, and south of the Desert Harvest site, and one active but non-reproductive nest was reported in the Coxcomb Mountains, about 5 miles northeast of the site (BLM 2011a).

The proposed solar generator site and gen-tie line alignments are on the Chuckwalla Valley floor, and do not provide suitable golden eagle nesting habitat. No on-site impacts to nest sites are expected, but golden eagles are sensitive to human disturbances during the nesting season. If there is an active nest nearby, then human activity and noise during project construction could adversely affect golden eagle nesting success. Most golden eagle nests in the surrounding mountain ranges were inactive in 2010 (Ironwood Consulting 2010). There was golden eagle activity, but not reproduction, at one nest site northeast of the DHSP site. However, even if golden eagle territories may be inactive in a given year, they may be used in future years. Therefore, unoccupied territories are considered potentially active in future years.

The project site and gen-tie alignments provide suitable golden eagle foraging habitat. Golden eagles could forage at the Desert Harvest site at any time of year. Foraging birds could include mated pairs using the surrounding nesting territories; or, if the territories are inactive, unmated golden eagles or adult birds whose nests may have failed, could forage over the site during breeding season. Foraging would probably be somewhat more common during winter and migration seasons due to larger numbers of golden eagles in the region and their larger winter foraging ranges.

If the project would take golden eagles, as defined by the BGEPA and USFWS (2007), above, then consultation with the USFWS would be required. The USFWS recommends evaluating potential impacts to nesting and foraging golden eagles by evaluating eagle use of the area and inventorying golden eagle territories if suitable nesting, roosting, and foraging habitat are present on a proposed project site or within a 10-mile radius of the site (Pagel et al. 2010). In addition to its federal status under the BGEPA, the golden eagle is designated by the California Fish and Game Code as a fully protected species and by BLM as a sensitive species (below).

Desert wash woodlands on the Desert Harvest site may provide suitable nesting and foraging habitat for Gila woodpecker. The woodlands are dominated by desert ironwood trees, and most of the blue palo verdes are too small for cavity nests. However, scattered larger blue palo verde trees are present in low numbers throughout the woodlands, and could serve as suitable nest trees.

Although no Gila woodpecker observations were made on the site during breeding season surveys, it is possible that they may nest in desert wash woodland habitat on or near the site. Project development would eliminate up to 180 acres of potential nesting and foraging habitat for Gila woodpecker on the proposed solar generator site, and could also affect smaller areas of suitable habitat along gen-tie alignments. Habitat impacts on the gen-tie alignments would generally be limited to small areas around the transmission line structures, and increased human disturbance during construction, operations/maintenance, and decommissioning project phases.

In addition to habitat impacts, the project could cause mortality or injury to a Gila woodpecker (including juvenile birds or eggs), if an active nest were damaged or disturbed during construction or other phases of the project. Potential project impacts would be comparable to those described for nesting birds, below. As a state-listed species, any take of Gila woodpecker would necessitate CESA permitting under § 2081 of the California Fish and Game Code. Avoidance of take, as defined by the Fish and Game Code, could be achieved by implementing measures to avoid all nesting birds (see Native Birds: Migratory Bird Treaty Act / California Fish And Game Code, below).

Swainson's hawk (*Buteo swainsoni*): The Swainson's hawk is listed as a threatened species under CESA but has no federal listing status. It is a migratory raptor. It breeds in open plains and prairies in the Great Plains and relatively arid areas of western North America, including the Central Valley and the western Mojave Desert in California. It winters in South America, primarily in Argentina. During the spring and fall migration seasons, Swainson's hawks are observed regularly in southern California.

DHSP occurrence or effects: One Swainson's hawk was observed flying over the Desert Harvest project site during April 2011 (AMEC 2011d). The project area may serve as incidental foraging habitat during migratory seasons, but otherwise would not support Swainson's hawks, due to the distance from its breeding range. Project development would not affect nesting habitat and has little likelihood of adversely affecting Swainson's hawk.

Species Protected Under the Federal Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d; BGEPA) prohibits take of bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*). The BGEPA defines *take* to include "pursuing, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting, and disturbing." The USFWS (2007) further defines *disturb* as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

Golden Eagle (*Aquila chrysaetos*): Golden eagles are year-around residents throughout most of their range in the western United States. In the southwest, they are more common during winter when eagles that nest in Canada migrate south into the region. They breed from late January through August, mainly during late winter and early spring in the California deserts (Pagel et al. 2010). In the desert, they generally nest in steep, rugged terrain, often on sites with overhanging ledges, cliffs or large trees as cover. Golden eagles are wide-ranging predators, especially outside of the nesting season, when they have no need to return daily to eggs or young at their nests.

coincide with observed variation among tortoise populations. The DHSP and the gen-tie alternatives are located in the Colorado Desert Recovery Unit.

The nearest documented desert tortoise locations are on the Desert Sunlight project site, about 0.3 mile north of the DHSP site, and on gen-tie alignments B, C, and D (BLM 2011a; Ironwood Consulting 2010). In addition, a road-killed desert tortoise was observed at the Eagle Mountain off ramp on east-bound Interstate 10 approximately 7.5 miles southwest of the site (AMEC 2011a).

No live desert tortoises or recent sign were observed on the DHSP site or adjacent areas during the 2010 and 2011 field surveys. However, several desert tortoise burrows, designated as class 2 (good condition) and class 3 (deteriorated condition), and several disarticulated bone fragments, possibly originating from a desert tortoise, were located on the site. None of the burrows or other sign exhibited any evidence of recent use or corroborating sign. The occurrence of tortoise sign, even where no living tortoises are found during surveys, indicates desert tortoise presence (USFWS 2010a). Desert tortoises are found throughout the region and are mobile during their active seasons. Based on the presence of active desert tortoises on the adjacent project site and gen-tie alignments, we conclude that the entire Desert Harvest project site and all gen-tie alignments may be occupied by desert tortoises at any time, albeit only in low numbers. Project development would eliminate 1,208 acres of desert tortoise habitat and could kill or injure desert tortoises on the site. Project development will necessitate consultation between the BLM and USFWS per Section 7 of the ESA, and permitting from CDFG under Section 2080.1 or 2081 of the California Fish and Game Code.

Gila woodpecker (*Melanerpes uropygialis*): The Gila woodpecker is listed as endangered under CESA but has no status under the federal ESA. It is a bird species of conservation concern (USFWS 2008). Its geographic range is generally in southern Arizona and southward into Baja California and western mainland Mexico. It occupies this range year-around (i.e., it is not migratory). In California, Gila woodpeckers are known from riparian forests along the Colorado River, and from desert wash woodlands in Imperial County (McCreedy 2008). It excavates cavity nests in large riparian trees such as cottonwoods and (in upland habitats) saguaro cacti, and feeds largely on insects, mistletoe berries, and cactus fruits (Rosenberg et al. 1991; McCreedy 2008). Its primary habitat is Cottonwood-Willow Riparian Woodland, but it also uses thickets of other desert trees (e.g., desert ironwood), as well as upland habitats, especially outside the breeding season. Desert ironwood is apparently too dense for nest excavation. Where Gila woodpeckers occur in dry desert wash woodlands, they excavate cavity nests "invariably" in large blue palo verdes rather than ironwood (McCreedy 2008). In suburban habitats, they nest in ornamental trees including athel (*Tamarix aphylla*), gum trees (*Eucalyptus* spp.), and palms. Availability of suitable nesting trees is apparently a limiting factor in breeding habitat suitability (Grinnell and Miller 1944).

DHSP occurrence or effects: A Gila woodpecker was observed in the southeastern part of the project site in December 2010, but was not seen again during the BLM protocol winter season or breeding season avian point counts (AMEC 2011d).

The Desert Harvest project site is about 40 miles west of the Gila woodpecker's published geographic range (McCreedy 2008), but unpublished observations have been reported from Corn Springs, about 11 miles south of the site and about five miles south of the southern end of the gen-tie alignments (C. McGaugh, AMEC, pers. obs.). There is a native palm grove at Corn Springs, and Gila woodpeckers may nest in the palm trees. Also, a Gila Woodpecker was reported on September 28, 2010 during field surveys for the Desert Sunlight project (AMEC 2011d). It is possible that the Corn Springs and Desert Center areas support a small Gila woodpecker population, or that the two local observations in late 2010 were chance observations of an itinerant individual.

The sizes of desert tortoise home ranges vary with respect to location and resource availability, and may vary among years. Male tortoises' home ranges can be as large as 200 acres, while females' long-term home ranges may be less than half that size. Core areas used within tortoises' larger home ranges depend on the number of burrows. Over its lifetime, a desert tortoise may use more than 1.5 square miles of habitat and may make periodic forays of several miles at a time.

Tortoises are long-lived and grow slowly. They require 13 to 20 years to reach sexual maturity. Their reproductive rates are low, though their reproductive lifespan is long. Mating may occur both during spring and fall. The number of clutches (set of eggs laid at a single time) and number of eggs that a female desert tortoise produces is dependent on habitat quality, seasonal food and water availability, and the animal's physiological condition. Egg-laying occurs primarily between April and July; the female typically lays 2-14 (average 5-6) eggs, which are buried near the mouth of a burrow or beneath a shrub. The eggs typically hatch 90 to 120 days later, between August and October. Clutch success rates are unknown and nest predation rates are variable, but predation appears to be an important cause of clutch failure.

Desert tortoise population trends have been difficult to discern. The USFWS (2011c) reviews population monitoring efforts dating back to the 1980s, and concludes that available data provide qualitative (not quantitative) insight to range-wide trends, and show appreciable declines at the local level in some areas. A more formal and consistent range-wide monitoring study was initiated in 2001, but no range-wide trend has been identified over that period.

Desert tortoise populations are threatened by several factors, each of which tends to be exacerbated by the others and most of which are associated with human land uses and other human activities. Most threats identified in the 1980s as the bases for state and federal listing continue to affect tortoise populations today. Habitat degradation and loss due to land use conversion, grazing, mining, energy development, and transportation projects have all contributed to declining tortoise numbers and fragmented populations. Off-road vehicle use degrades habitat and causes direct mortality from vehicle collision or crushed burrows. Desert tortoises are also vulnerable to vehicle collisions on roads and highways. Drought, habitat degradation, and associated weed invasion lead to reduced nutrient quality of food plants; this increases desert tortoise susceptibility to upper respiratory tract disease, and possibly other diseases, which can be fatal and is transmittable among populations. Juvenile tortoises are vulnerable to predation by ravens; juvenile and adult tortoises are preyed upon by coyotes and domestic and feral dogs. Infrastructure development and urbanization creates perch sites and food and water sources for ravens, and increases numbers of dogs and coyotes, all of which elevate predation pressure on tortoises. Other factors affecting tortoises and their habitat include illegal collecting, vandalism, livestock grazing, feral burros, invasive non-native plants, changes to natural fire regimes, and environmental contaminants. Habitat fragmentation and development can isolate tortoise populations, further increasing risk of disease and reducing genetic diversity. This range of threats can kill or indirectly affect desert tortoises and their habitat, but little is known about the relative contribution each threat makes to tortoise demography. Current recovery planning (USFWS 2011c) focuses on expanding the knowledge of individual threats and places emphasis on understanding their multiple and combined effects on tortoise populations.

DHSP occurrence or effects: The DHSP site is not within designated critical habitat for the desert tortoise, but portions of the transmission line alternative alignments are within the Chuckwalla Critical Habitat Unit, west of Kaiser Road and near the I-10 Freeway (see Figure 6). The USFWS (2011c) identifies five recovery units for the desert tortoise based largely on geographic discontinuities or barriers that

Desert unicorn-plant (*Proboscidea althaeifolia*): Desert unicorn-plant, also called “devil’s claw,” is a perennial herb that grows from a large rooststock. It is dormant in spring, but sprouts in response to summer rains. It ranges throughout much of the Sonoran Desert, eastward to Texas and parts of mainland Mexico. It is conspicuous for its woody, hook-shaped fruits (pods), that are evidently dispersed by clinging to fur or hooves of large mammals. It is ranked as CRPR 4.3 (limited distribution, “watch list”). It is not managed by BLM as a sensitive species (BLM 2010a).

DHSP occurrence or effects: Desert unicorn-plant was located at several sites on the Desert Harvest project site and along gen-tie alignment Alternative E during fall, 2011, but not fall 2010 (Figure 3).

Listed Threatened or Endangered Wildlife

This section includes species listed as threatened or endangered under CESA or ESA. One listed threatened or endangered species, the desert tortoise, occurs near the project site. Two others (Gila woodpecker and Swainson’s hawk) have been observed on or near the site during migratory or wintering seasons, but are not expected to use the site for breeding. Other listed species of the region are either limited to riparian and aquatic habitats (e.g., southwestern willow flycatcher, least Bell’s vireo, and desert pupfish) or occur well outside the area (e.g., Coachella Valley fringe-toed lizard).

Desert Tortoise (*Gopherus agassizii*): The desert tortoise is listed as threatened under CESA, and the Mojave population (i.e., west of the Colorado River) is listed as threatened under the federal ESA. East of the Colorado River, the desert tortoise’s range extends into the Arizona deserts, and south through Sonora (Mexico). Tortoises east of the Colorado River have been considered a separate population of the same species, but recent work by Murphy et al. (2011) suggests that they should be recognized as a distinct species, Morafka’s desert tortoise (*Gopherus morafkai*). All wild desert tortoises in California are part of the state and federally listed Mojave population.

The USFWS reviewed desert tortoise biology and population status in the recent Revised Recovery Plan (USFWS 2011c). The following summary is based on that review and literature cited therein. Desert tortoises spend much of their lives in burrows. They enter hibernation during autumn. In late winter or early spring, they emerge from over-wintering burrows and typically remain active or partially active through fall. Activity decreases in summer, but tortoises often emerge after summer rain storms to drink and to take advantage of seasonal food availability during the few weeks following late summer rains. They may become dormant during extended periods of summer heat and dryness. A single tortoise may have a dozen or more burrows within its home range, and different tortoises may use these burrows at different times. Even during their active seasons, they are inactive during much of the day or night, within burrows or at “palettes” (partially sheltered flattened areas, often beneath shrubs or large rocks) or other shaded sites.

Adult desert tortoises lose water at such a slow rate that they can survive for more than a year without access to free water of any kind and can apparently tolerate large imbalances in their water and energy budgets. During periods of inactivity, their metabolism and water loss are reduced. Desert tortoises eat a wide variety of herbaceous vegetation, particularly grasses and the flowers of annual plants.

Desert tortoise habitats include many landforms and vegetation types of the Mojave and Sonoran deserts, except the most precipitous slopes. Friable soils, such as sand and fine gravel, are important for burrow excavation and nesting, and the availability of suitable soils is a limiting factor to desert tortoise distribution.

are included in CDFG and CNPS rankings as CRPR 2, 3, or 4 are included in Table 3, but only those species reported from the site are addressed below.

Emory's crucifixion thorn (*Castela emoryi*): Emory's crucifixion thorn is endemic to the Sonoran and southern Mojave Deserts of the American southwest. It is widely scattered in southwestern Arizona; its scattered occurrences in the California deserts are the western extent of its range (Turner et al. 1995). The most well known stand is at the Crucifixion Thorn Natural Area (CTNA) in Imperial County, California. It also occurs at a few sites in northwestern Sonora, Mexico, and in northern Baja California immediately adjacent to the CTNA. Emory's crucifixion thorn is a leafless shrub or small tree of washes, non-saline dry lakes, and other sites where water accumulates. The plants are long-lived and densely thorny. The stems are light gray-green, rigid, ascending (directed upward) with stout spine-tipped twigs. Its flowers are inconspicuous and abundant. The fruits, after maturing, remain on the plant for several years. Young plants, prior to fruiting, do not have the characteristic clustered fruits of older plants. Plants occur as scattered colonies, possibly clones, of fairly small size that do not extend far across the landscape (Shreve and Wiggins 1964). Emory's crucifixion thorn is assigned to CRPR 2.3 (rare, threatened, or endangered in California, but more common elsewhere). It is not managed by BLM as a sensitive species (BLM 2010a).

DHSP occurrence or effects: Three individual crucifixion thorn plants were located along the western boundary of the larger, northeastern project parcel, and numerous additional plants were located in the smaller, southwestern parcel (Figure 3). Large stands of crucifixion thorn are described as "crucifixion thorn scrub" (Sawyer et al. 2009), but the density and extent of the plants on the Desert Harvest site do not warrant mapping as a distinct vegetation type.

Utah vine milkweed (*Cynanchum utahense*, *Funastrum utahense*): Utah vine milkweed is a perennial herb that dies back to the ground in summer. It ranges from the California deserts to southwestern Utah. Its habitat is desert washes and canyons (Bell 2009). Utah vine milkweed is assigned to CRPR 4.2 (limited distribution, "watch list"). It is not managed by BLM as a sensitive species (BLM 2010a).

DHSP occurrence or effects: It was recorded on the site during 2010 spring botanical surveys (AMEC 2011a; see Figure 3), but was not relocated in subsequent surveys. Aspen botanists located a single Utah vine milkweed a short distance outside the project area while visiting a reference location of slender-spined allthorn (below).

Slender-spined allthorn (*Koeberlinia spinosa* var. *tenuispina*): Slender-spined allthorn is a densely-branched shrub, to several meters tall, with dark green bark (Turner et al. 1995). Most verified California locations are within the Chocolate Mountains, a few miles south of the Desert Harvest site, but it also occurred on the Desert Sunlight project site, north of the Desert Harvest site. It resembles crucifixion thorn (above), and is distinguished by stems, which are brighter green, not as stout, and branched at right angles rather than ascending. It does not retain fruits on the stems after maturation. It is assigned to CRPR 2.2 (rare, threatened, or endangered in California but more common elsewhere). It is not managed by BLM as a sensitive species (BLM 2010a).

DHSP occurrence or effects: The CNDDDB reported a slender-spined allthorn occurrence in the smaller, southwest parcel of the proposed Desert Harvest project site, but Aspen botanists located that plant and determined that it was a young crucifixion thorn, without fruits on the stems. Based on field survey results, we conclude that slender-spined allthorn is not likely to occur on the site.

Chaparral sand verbena (*Abronia villosa* var. *aurita*): Chaparral sand-verbena's distribution and identification are unclear in published reference works, including Spellenberg (2002), CNPS (2011) and CNDDDB (CDFG 2011). It is a BLM sensitive species, and ranked as CRPR 1B. This plant was added to the CNPS Inventory based on recommendations by Andrew C. Sanders of the UC Riverside Herbarium. The primary conservation concern is for chaparral sand-verbena occurrences in western Riverside County and other locations outside the desert (see Roberts et al. 2004). These western plants appear to be distinct from the very common desert sand verbena, *Abronia villosa* var. *villosa*. Plants in the low desert often match the characteristics of the western Riverside County populations, but they are not regionally rare.

DHSP occurrence or effects: There is some possibility that gen-tie alignment alternative E, and road margins near Highway 95, may support chaparral sand verbena. Road margins are subject to routine vehicle disturbance; project activities would not add to the existing and ongoing disturbance to roadside soils.

Harwood's woolly-star (*Eriastrum harwoodii*): Harwood's woollystar is an annual species known only from partially stabilized aeolian sand habitats in the deserts of eastern Riverside and San Bernardino counties (Gowen 2008) and San Diego County (DeGroot 2008). It is a BLM sensitive species, and ranked as CRPR 1B. It flowers in early April.

DHSP occurrence or effects: The only portion of the project that would affect suitable habitat for Harwood's woolly-star would be gen-tie alignment Alternative E, which would cross dunes and partially stabilized aeolian sand habitat over part of its length. Spring botanical surveys will be conducted along gen-tie Alternative E in 2012 to determine presence or absence of this species.

Orocopia sage (*Salvia greatae*): Orocopia sage is a shrubby sage with spiny leaves and lavender flowers. It is a BLM sensitive species, and ranked as CRPR 1B. It is endemic to the Orocopia and Chocolate mountains, Riverside County, where it occurs in desert washes below about 2800 feet elevation. It also has been reported from the Mojave Desert in San Bernardino County, though that report almost certainly refers to a misidentification of Death Valley sage (*S. funerea*) (A. Sanders, UC Riverside, pers. comm.).

DHSP occurrence or effects: Habitat on the project site appears to be suitable, but the site is a few miles north of its known geographic range. It has not been located on the site during field surveys, but there is a low probability that it may occur on the site.

Mesquite neststraw (*Stylocline sonorensis*): Mesquite neststraw is known from southeastern Arizona and northeastern Sonora, Mexico. It has only been documented at one California location, near Hayfields Dry Lake, where it was collected in the 1930s. It is now presumed extirpated in California. It is ranked as CRPR 1A. Its habitat is reported as "grassy hillsides, sandy drainages, with mesquite" (Morefield 2006).

DHSP occurrence or effects: The only potential habitat in the project area is along gen-tie alignment Alternative E, on valley-floor drainages. Mesquite nest-straw is not expected to occur in the project area due to its apparent extirpation in California.

Other Special-Status Plants

In addition to the statutes and policies described above, several public agencies and private entities maintain lists of plants and animals of conservation concern. The CDFG compiles these in its compendia of "Special Plants." These plants are treated here as "special status species." All plants of the region that

A Mojave fringe-toed lizard habitat evaluation was conducted by Robert Black within the proposed solar facility site boundaries and development footprint on February 25, March 5, and March 12, 2011 to identify potential habitat, individuals, and/or sign that would indicate potential occupancy of the project site by this species.

Aspen biologists evaluated suitability for seasonal Couch's spadefoot breeding habitat on the project site and gen-tie line Alternative E, based on soils and topography observed during vegetation mapping and streambed delineation field work, described in Section 3.3. Desert kit fox burrows and sign were noted during desert tortoise and subsequent vegetation mapping and streambed delineation field work.

Results and Discussion

Listed Threatened or Endangered Plants

This section describes species reported from the region that are listed as threatened or endangered under the federal ESA or CESA. One listed threatened or endangered plant, Coachella Valley milk-vetch, has been reported in the Chuckwalla Valley, though that report is now discounted (see below). Other listed threatened or endangered species of the low desert region (e.g., triple-ribbed milk-vetch, Peirson's milk-vetch) occur well outside the area and are not addressed in this report. No listed threatened or endangered plant species, or species proposed for listing or candidates for listing, has been documented from the project site or gen-tie alternative alignments.

Coachella Valley milk-vetch (*Astragalus lentiginosus* var. *coachellae*): Coachella Valley milk-vetch is an annual or short-lived perennial endemic to the Coachella Valley. It is federally listed as endangered, a BLM sensitive species, and ranked as CRPR 1B. It is primarily found on loose aeolian (wind transported) or, less-often, in alluvial (water transported) sands, on dunes or flats and along disturbed margins of sandy washes. The easternmost known occurrences are near Indio, about 45 miles west of the Desert Harvest project area. All designated critical habitat for Coachella Valley milk-vetch is within the Coachella Valley, west of Indio (USFWS 2011a). Specimens resembling Coachella Valley milk-vetch have been collected from the Pinto Wash and Palen dune system, northeast of Desert Center. However, the USFWS (2009; 2011a) regards these as the related variety, speckled milk-vetch (*A. lentiginosus* var. *variabilis*), which has no special conservation status.

DHSP occurrence or effects: The only portion of the project that would affect suitable habitat for Coachella Valley milk-vetch would be gen-tie alignment Alternative E, which would cross dunes and partially stabilized aeolian sand habitat over part of its length. However, since the project area and vicinity are well outside the recognized geographic range, no project impacts to Coachella Valley milk-vetch would be expected.

BLM Sensitive Plants

The BLM (2010a) maintains a list of Sensitive Species, including species that are rare, declining, or dependent on specialized habitats. The list includes all plants ranked by CNPS and CDFG as CRPR 1B. The BLM manages sensitive species to provide protections comparable to species that may become listed as threatened or endangered (i.e., candidate species for federal listing). None of these species has been documented from the project site or gen-tie alternative alignments. Each BLM sensitive plant species known from the project vicinity is described briefly, below.

Special-Status Wildlife Species	Habitat and Distribution	Activity season	Conservation Status	Occurrence Probability
<i>Vulpes macrotia arsipus</i> Desert kit fox	Widespread, open desert lands; constructs below-ground dens; requires soil suitable for burrowing; primarily nocturnal; preys on small mammals	Year-around	Federal: none BLM: none State: Calif. Code of Regs. Title 14 § 460	Present; numerous burrows on-site
<i>Felis concolor browni</i> Yuma mountain lion	Low desert, JTNP, to Colorado River; primarily in dense riparian habitats of river and dense desert wash scrub of canyons, where water and prey are available	Year-around	Fed: none BLM: NECO Calif: SSC	Expected in low numbers throughout area
<i>Odocoileus hemionus eremicus</i> (<i>O. h. crooki</i>) Desert mule deer, burro deer	Colorado desert, scattered mountains and bajadas, gen. near dependable water sources	Year-around	Federal: none BLM: NECO State: none	Expected in low numbers throughout area
<i>Ovis canadensis nelsoni</i> Nelson's bighorn sheep	Open shrublands and conifer forest, remote mountains; scattered populations in desert mountains and surrounding ranges, incl. Transverse and Peninsular ranges	Year-around	Fed: none BLM: Sensitive, NECO Calif: S3, FP (selected populations)	Expected in low numbers, mainly to move among mountain ranges
General References: American Ornithologists Union 1998 (including supplements through 2011); Barbour and Davis 1969; Feldhammer et al. 2003; Garrett and Dunn 1981; Grinnell and Miller 1944; Hall 1981; Jennings and Hayes 1994; Rosenberg, et al. 1991; Schuford and Gardali 2008; Stebbins 2003; Wilson and Ruff 1999. Conservation Status and Occurrence Probability defined above (Table 3).				

Focused surveys for desert tortoise were conducted over 100 percent of the larger, northeastern parcel during spring 2010 (AMEC 2011b) and the smaller, southwestern parcel in spring 2011 (AMEC 2011c), as well as adjacent buffer areas, in accordance with USFWS survey protocol (2010). Belt transects, spaced 10 meters (m) apart, were systematically walked over both parcels. When observed, any potential desert tortoise sign (e.g., burrows) was documented on appropriate survey forms. Potential desert tortoise sign observed was photographed and mapped using handheld GPS equipment. Where present, desert woodrat (*Neotoma lepida*) middens and animal burrows of various kinds (e.g., desert kit fox, coyote, badger, ground squirrel, kangaroo rat) were carefully inspected for presence of desert tortoises and their sign. Parallel belt transects were also walked within the zone of influence around the perimeter of the sites at intervals of 200, 400 and 600 meters. General weather conditions were recorded at the start and end of each survey. Temperatures and time of day were recorded at the start and end of each transect.

Phase II (burrow surveys) for burrowing owls were conducted concurrently with desert tortoise surveys. Each burrow encountered during the desert tortoise survey was examined for sign of desert tortoise activity, as well as burrowing owl activity. These surveys provide data that is equivalent to Phase II burrow surveys (CBOC 1993).

Avian point-count surveys were conducted by AMEC biologists during winter and spring of 2011 to comply with BLM requirements (2009b). Winter season point counts were conducted during January 2011, and breeding season point counts were between March 30 and April 28, 2011.

The descriptions of regional golden eagle habitat, nest sites, and territory occupancy are based on the data provided in the Desert Sunlight Solar Farm EIS and supporting documents (BLM 2011b; Ironwood Consulting 2010).

Special-Status Wildlife Species	Habitat and Distribution	Activity season	Conservation Status	Occurrence Probability
<i>Antrozous pallidus</i> Pallid bat	Rock outcrops of shrublands, mostly below about 6000 ft. elev.; Calif, SW N Amer through interior Oregon and Washington; hibernates in winter	Warm season	Fed: none BLM: Sensitive Calif: SSC S3	Low potential for roosting on site; high potential for foraging in area
<i>Corynorhinus (Plecotus) townsendii</i> Townsend's big-eared bat (incl. "pale," "western," and other subspecies)	Many habitats throughout Calif and W N Amer, scattered populations in E; day roosts in caves, tunnels, mines; feed primarily on moths	Year-around	Fed: none BLM: Sensitive Calif: SSC, S2S3	Low potential for roosting on site; high potential for foraging in area
<i>Euderma maculatum</i> Spotted bat	Desert (cool seasons) to pine forest (summer), much of SW N Amer. but very rare; roosts in deep crevices in cliffs, feeds on moths captured over open water	Not known	Fed: none BLM: Sensitive Calif: SSC S2S3	Low potential for roosting or foraging on site
<i>Eumops perotis californicus</i> California mastiff bat	Lowlands (with rare exceptions); cent. and S Calif., S Ariz., NM, SW Tex., N Mexico; roost in deep rock crevices, forage over wide area	Year-around	Fed: none BLM: Sensitive, NECO Calif: SSC S3?	Low potential for roosting on site; high potential for foraging in area
<i>Lasiurus xanthinus (Nycteris ega xanthina)</i> Western (Southern) yellow bat	Mexico and Cent. Amer., to S AZ; Riv., Imperial and San Diego Cos.; riparian and wash habitats; roosts in trees; evidently migrates from Calif. during winter	Spring-summer?	Fed: none BLM: none Calif: S3	Low potential for roosting on site; high potential for foraging in area
<i>Macrotus californicus (M. waterhousii)</i> California leaf-nosed bat	Arid lowlands, S Calif., S and W Ariz., Baja Calif. and Sonora, Mexico; roost in mine-shafts, forage over open shrublands	Year-around	Fed: none BLM: Sensitive, NECO Calif: SSC S2S3	Low potential for roosting on site; high potential for foraging in area
<i>Nyctinomops macrotis (Tadarida molossa)</i> Big free-tailed bat	Roosts in crevices of rocky cliffs, scattered localities in W N. Amer. through Cent. Amer.; ranges widely from roost sites; often forages over water	Year-around (?)	Fed: none BLM: none Calif: SSC S2	Low potential for roosting on site; high potential for foraging in area
<i>Nyctinomops femorosaccus (Tadarida femorosaccus)</i> Pocketed free-tailed bat	Deserts and arid lowlands, SW US, Baja Calif., mainland Mexico; Roost mainly in crevices of high cliffs; forage over water and open shrubland	Year-around	Fed: none BLM: NECO Calif: SSC S2S3	Low potential for roosting on site; high potential for foraging in area
<i>Xerospermophilus tereticaudus chlorus (Spermophilus t. c.)</i> Palm Springs round-tailed ground squirrel (or Coachella Valley round-tailed ground squirrel)	Widespread in California deserts, Coachella Valley to Death Valley; formerly considered endemic to mesquite and sandy habitats in Coachella Valley	Year-around	Fed: none (former candidate) BLM: Sensitive Calif: SSC S2S3	Occurs (reported on site and near genetic Alignment B)
<i>Neotoma albigula venusta</i> Colorado Valley woodrat	Desert shrublands; SE Calif., SW Ariz., adj. Mexico, and southernmost Nevada; closely associated with beavertail or mesquite thickets	Year-around	Fed: none BLM: NECO Calif: S1S2	Low (habitat marginal)
<i>Taxidea taxus</i> American badger	Mountains, deserts, interior valleys where burrowing animals are avail as prey and soil permits digging; throughout cent and W N Amer	Year-around	Fed: none BLM: none Calif: CSC S4	Present; disused burrow on-site; expected in low numbers throughout area

Special-Status Wildlife Species	Habitat and Distribution	Activity season	Conservation Status	Occurrence Probability
<i>Asio otus</i> Long-eared owl	Breed in riparian woodlands; forage (nocturnally) over open land; sea level to about 6000 ft. elev.; through N America and Eurasia	Year-around	Fed: none BLM: none Calif: S3 SSC (nesting)	Breeding: Minimal (no habitat) Winter: Minimal (but occurs rarely at Lake Tamarisk)
<i>Chaetura vauxi</i> Vaux's swift	Breeds central Calif. and northward, in coastal and montane forests; winters in Central and S America	Spring and fall migr. seasons	Fed: none BLM: none Calif: SSC S3 (nesting)	Nesting: Minimal (outside range) Migration: Occurs, occasional flyover
<i>Melanerpes uropygialis</i> Gila woodpecker	Saguaro woodlands, sometimes other woodlands; cavity nester mainly in cactus; SE Calif., S Ariz, W Mexico (incl. Baja)	Year - around	Fed: none BLM: Sensitive Calif: END S1S2	Nesting: Minimal (ironwood poor for nest constr.) Winter Occurs (Dec 2010) see text
<i>Lanius ludovicianus</i> Loggerhead shrike	Woodlands, shrublands, open areas with scattered perch sites; not dense forest; widespread in N America; valley floors to about 7000 ft. elev.	Year-around	Fed: none BLM: none Calif: SSC S4 (nesting)	Occurs (suitable habitat throughout)
<i>Apelocoma californica cana</i> Scrub jay (Eagle Mtn population)	Locally endemic year-around resident in pinyon woodlands in the Eagle Mountains; long-disjunct from other populations	Year-around	Fed: none BLM: none Calif: CDFG watch list, S1S2	Occurs? (observed as transient, Oct 2011; see text)
<i>Toxostoma bendirei</i> Bendire's thrasher	Joshua tree woodland, desert scrub; high cactus cover; mainly E Mojave Des in Calif. (scarce in W Mojave); American SW and mainl. Mexico; winters in S Arizona, New Mexico, and mainl. Mexico	Spring-summer	Fed: none BLM: Sensitive, NECO Calif: SSC S3	Low-Moderate; marginal habitat throughout
<i>Toxostoma crissale</i> Crissal thrasher	Nests in dense, low, brushy thickets of mesquite or other desert riparian shrubs; Sonoran Des, E Mojave Des, to Texas, W mainland Mexico	Year - around	Fed: none BLM: NECO Calif: SSC S3	Low-moderate; habitat marginally suitable
<i>Toxostoma lecontei</i> LeConte's thrasher	Calif. deserts, SW Central Val. & Owens Val., east to Utah, Arizona; open shrubland, often sandy or alkaline flats	Year - around	Fed: none BLM: NECO Calif: S3 (SSC in San Joaquin Val)	High; suitable habitat throughout
<i>Pyrocephalus rubinus</i> Vermillion flycatcher	Desert riparian woodlands and shrublands; SE Calif., east through S Texas, and S through Mexico; winters in Mexico	spring - summer	Fed: none Calif: SSC S2S3 (nesting)	Nesting: Moderate (suitable nesting habitat in ironwood stands)
<i>Vermivora luciae</i> Lucy's warbler	Cavity-nesting species; breeds in desert riparian woodlands through much of Arizona; winters on Pacific Coast of mainl. Mexico	spring - summer	Fed: none BLM: Sensitive Calif: SSC S2S3 (nesting)	Nesting: Moderate (margin of known range; see text) Migration: Occurs singing males observed April 2011

MAMMALS

Special-Status Wildlife Species	Habitat and Distribution	Activity season	Conservation Status	Occurrence Probability
<i>Aquila chrysaetos</i> Golden eagle	Nests in remote trees and cliffs; forages over shrublands and grasslands; breeds throughout W N America, winters to E coast	Year-around	Fed: Eagle Protection act (see text) BLM: NECO Calif: SSC S3 fully protected	Nesting: Minimal on-site, occurs in surrounding mtns Foraging: High (year-around)
<i>Pandion haliaetus</i> Osprey	Nests in northern N America and Mexican coastlines near large water bodies, preys primarily on fish; winters in central Calif to S America;	Spring and fall migr. seasons	Fed: none BLM: none Calif: S3, watch list (nesting)	Nesting: Minimal (outside range; no suitable sites) Migration: Occurs, occasional flyover
<i>Buteo swainsonii</i> Swainson's hawk	Breeds in trees in open habitats (e.g., grassland), Central Valley and W Mojave Des (Calif.) and east to cent. US, S. Canada, N. Mexico; winters in S America.	Spring and fall migr. seasons	Fed: none BLM: none Calif: S2, THR	Nesting: Minimal (outside range; no suitable sites) Migration: Present, occasional flyover
<i>Buteo regalis</i> Ferruginous hawk	Forages over grassland and shrubland; winters in W and SW N Amer. (breeds in Great Basin and N plains)	Winter	Fed: none BLM: NECO Calif: SSC S3S4 (wintering)	Nesting: Minimal (outside range) Winter: Expected (rarely)
<i>Accipiter striatus</i> Sharp-shinned hawk	Nests and hunts in forest & woodland mainly to N (may breed in S Calif. Mtn woodlands); also forages in open areas; regularly winters in S Calif.	Winter	Fed: none BLM: none Calif: SSC S3 (nesting)	Nesting: Minimal (no habitat, outside range) Winter/Migration: Occurs (Jan 2011)
<i>Accipiter cooperii</i> Cooper's hawk	Nests and hunts in forest & woodland, also forages in open areas; most of US, Central and S America	Year-around	Fed: none BLM: none Calif: SSC S3 (nesting)	Nesting: Minimal (no habitat) Winter/Migration: Expected
<i>Falco columbaris</i> Merlin	Uncommon in winter in S Calif. desert and valleys (breeds in northern N America and Eurasia)	Winter	Fed: none BLM: none Calif: SSC S3 (wintering)	Nesting: Minimal (outside range) Winter: Expected
<i>Falco mexicanus</i> Prairie falcon	Nests on high cliffs, forages primarily over open lands; occurs throughout arid western US and Mexico	Year-around	Fed: none BLM: NECO Calif: SSC S3 (nesting)	Nesting: Minimal on-site, occurs in surrounding mtns Foraging: High (year-around)
<i>Athene cunicularia</i> (<i>Speotyto cunicularia</i>) Burrowing owl	Nests mainly in rodent burrows, usually in open grassland or shrubland; forages in open habitat; increasingly uncommon in S Calif.; occurs through W US and Mexico	Year-around	Fed: none BLM: Sensitive, NECO Calif: SSC S2 (burrow sites)	Occurs (Sep 2011); see text
<i>Asio flammeus</i> Short-eared owl	Breeds in marshes and densely vegetated wetlands, forages over open wetlands, ag fields, and grasslands; temperate N & S America, Eurasia	Year-around	Fed: none BLM: none Calif: S3, SSC (nesting)	Breeding: Minimal (no habitat) Winter: Minimal (but reported near Lake Tamarisk)

- Meet the definition of rare or endangered under CEQA §15380(b) and (d).
- Considered special-status species in local or regional plans, policies, or regulations, such as the NECO Plan/EIS.

All special-status wildlife species identified by this literature review, and others known from the general region, are included in Table 4, which summarizes the natural history, agency status, and occurrence probability on the site for each special status wildlife species known from the region.

Table 4. Special-Status Wildlife of the Chuckwalla Valley Area.

Special-Status Wildlife Species	Habitat and Distribution	Activity season	Conservation Status	Occurrence Probability
AMPHIBIANS				
<i>Scaphiopus couchii</i> Couch's spadefoot	Breeds in seasonal rainpools following summer rains; burrows in sand remainder of year; eastern Colorado Desert, generally close to Colorado River	Summer	Fed: none BLM: Sensitive, NECO Calif: SSC	Minimal; no potential rainpool habitat; outside known geographic range
REPTILES				
<i>Gopherus agassizii</i> (<i>Xerobates agassizii</i>) Desert tortoise	Desert shrublands where soil suitable for burrows; Mojave and Sonoran des. (E Calif., S Nevada, W Ariz., and Sonora, Mexico)	Spring - summer	Fed: THR BLM: Sensitive, NECO Calif: THR S2	High; no recent sign, but near known occurrences (see text)
<i>Heloderma suspectum cinctum</i> Banded Gila monster	Rocky outcrops in desert shrubland; scarce in scattered eastern mountain ranges of Calif. deserts; to S Nevada, W Ariz., and Mainland Mexico	warm seasons	Fed: none BLM: Sensitive Calif: SSC S1	Minimal; outside known range and bajada habitat is poorly suitable
<i>Sauromalus obesus</i> (<i>S. ater</i>) Common chuckwalla	Rocky outcrops in desert shrubland; throughout deserts of Calif., S Nevada, W Ariz., and Baja Calif.	warm seasons	Fed: none BLM: NECO Calif: S4	Low; no suitable bedrock outcrops
<i>Uma scoparia</i> Mojave fringe toed lizard	Sand, especially dunes, sandy hummocks, washes, stabilized sand flats; below sea level to about 3000 ft. elev.; Death Valley, SW to Antelope Valley and SE to W Arizona	Warm season	Fed: none BLM: Sensitive, NECO Calif: SSC S3S4	Occurs on gen-tie Alt E; low potential remainder of project components; poorly suitable habitat (see text)
<i>Charina trivirgata</i> (<i>Lichanura trivirgata</i>) Rosy boa	Rocky chaparral and desert shrubland; gen below about 4500 ft. elev.; S Calif. through Baja Calif., SW Arizona, and western Sonora	Spring - summer	Fed: none BLM: NECO Calif: S3S4	Low-moderate (marginally suitable habitat throughout)
BIRDS				
<i>Circus cyaneus</i> Northern harrier	Breeds colonially in grasslands and wetlands; forages over open terrain; N America and Eurasia	Winter; rare in summer	Fed: none BLM: none Calif: SSC S3 (nesting)	Nesting: Minimal (no habitat) Foraging: Expected rarely, mainly winter

recommended field protocols (100 percent coverage and “intuitive controlled”). Tortoise biologists were supplied with a project-specific field guide containing illustrations of special-status plants potentially occurring on the site. The tortoise crew, accompanied by the botanist, covered the entire survey area and, during the surveys, directed the botanist to plants they did not recognize, or that resembled special-status plants of the area. Where special-status species were observed, the locations were recorded with hand-held global positioning system (GPS) devices.

Fall 2010 botanical surveys covered the entire DHSP site, but did not include the gen-tie alignments. The field methods followed the “intuitive controlled survey” methods, described by BLM (2009). Wood and Ray carried out a complete survey of washes and any low-lying areas throughout the two parcels where runoff from summer rains would have been most concentrated, and a less intense survey of upland bajada and desert pavement surfaces. The primary target species for these field surveys were glandular ditaxis and California ditaxis, based on recommendations in AMEC (2011a). On average, August is the wettest month, though Western Regional Climate Center (WRCC) reported no measureable rainfall at the Eagle Mountain station in August 2010. Results of the fall 2010 survey were augmented with additional incidental botanical observations made during fall 2011, during the vegetation mapping and streambed delineation field work, described above. Rainfall during late summer 2011 was much heavier, and numerous occurrences of one late-flowering species, desert unicorn-plant, were recorded.

Spring 2011 botanical surveys covered the smaller, southwestern DHSP site, following the 100 percent coverage survey method described by BLM (2009). Wood and Ray walked linear transects, spaced 10 meters apart, over the entire parcel. This survey method effectively covered 100 percent of the parcel. The WRCC has not updated precipitation records at the Eagle Mountain Station for 2011, but spring of 2011 was a drier rainfall year than 2010, and diversity of the spring flora was lower than recorded in spring 2010.

Fall 2011 botanical surveys of gen-tie alignment Alternative E by Aspen biologists Justin Wood, Dustin Ray, and Jared Varonin. They covered the entire alignment, by walking four intuitive-controlled transects (BLM 2009) along each segment of the alignment. On each segment, two biologists walked from a starting point, to an ending point, and then back. The WRCC has not updated precipitation records at the Eagle Mountain Station for 2011, but heavy rains occurred in late summer of 2011, and diversity of the summer-fall flora was greater than recorded in fall 2010.

Botanical surveys of gen-tie alignment Alternatives B, C, and D were completed during spring 2010 by Ironwood Consulting staff, as described in the Desert Sunlight EIS (BLM 2011a) and supporting documents.

Special-Status Wildlife

Based upon the literature and database review described above, a list of special-status wildlife species with potential to occur in the vicinity of the proposed project was compiled. In addition to the literature sources listed above for botanical surveys, the literature review included the CNDDB's Special Animals List (CDFG 2011b). Wildlife species were considered to be special-status species if they were classified as one or more of the following:

- Listed, proposed for listing, or candidates for listing as threatened or endangered under the federal ESA;
- Listed as threatened or endangered, or candidates for listing under CESA;
- Designated by BLM as Sensitive Animals (BLM 2010b);

- S4: Apparently secure in California; this rank is clearly lower than S3 but factors exist to cause some concern, i.e., there is some threat or somewhat narrow habitat. No threat rank.
- S5: Demonstrably secure or ineradicable in California. No threat rank.
- SH: All California occurrences historical (i.e., no records in > 20 years).
- SX: Presumed extirpated in California.

California Native Plant Society (CNPS) Rare Plant Rank designations. Note: According to CNPS

(<http://www.cnps.org/cnps/rareplants/ranking.php>), plants ranked as CRPR 1A, 1B, and 2 meet definitions as threatened or endangered and are eligible for state listing. That interpretation of the state Endangered Species Act is not in general use.

- 1A: Plants presumed extinct in California.
- 1B: Plants rare and endangered in California and throughout their range.
- 2: Plants rare, threatened or endangered in California but more common elsewhere in their range.
- 3: Plants about which we need more information; a review list.
- 4: Plants of limited distribution; a watch list.

California Rare Plant Rank Threat designations:

- .1 Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
- .2 Fairly endangered in California (20-80% occurrences threatened)
- .3 Not very endangered in California (<20% of occurrences threatened or no current threats known)

Definitions of occurrence probability: Estimated occurrence probabilities based literature sources cited earlier and field surveys and habitat analyses reported here.

- Occurs:* Observed on the site by qualified biologists.
- Expected:* Not observed or recorded on the site, but very likely present during at least a portion of the year.
- High:* Habitat is a type often utilized by the species and the site is within the known range of the species.
- Moderate:* Site is within the known range of the species and habitat on the site is a type occasionally used.
- Low:* Site is within the species' known range but habitat is rarely used, or the species was not found during focused surveys covering less than 100% of potential habitat or completed in marginal seasons.
- Minimal:* No suitable habitat on the site; or well outside the species' known elevational or geographic ranges; or a focused study covering 100% of all suitable habitat, completed during the appropriate season and during a year of appropriate rainfall, did not detect the species.
- Unknown:* No focused surveys have been performed in the region, and the species' distribution and habitat are poorly known.

AMEC biologists visited reference populations of two special-status species, Coachella Valley milk-vetch and Harwood's milk-vetch, to confirm that they could be reliably located and identified during the 2010 field surveys. Coachella Valley milk-vetch is the only listed threatened or endangered plant reported from the vicinity and Harwood's milk-vetch is a relatively widespread CRPR 2.2 species with potential to occur in the project area. In 2011, Aspen biologists visited reference populations of three additional special-status plants, California ditaxis, Utah vine milkweed, and desert all-thorn, to compare known examples with similar plants on the ROW.

During all botanical surveys, all plant species observed were identified in the field or collected for later identification. Plants were identified using keys, descriptions, and illustrations in regional references such as Shreve and Wiggins (1964), Munz (1974), and Baldwin et al. (eds., 2002). All species noted in each survey area are listed in the attached species list. In conformance with CDFG guidelines (2009), surveys were (a) conducted during flowering seasons for the special-status plants known from the area, (b) floristic in nature, (c) consistent with conservation ethics, (d) systematically covered all habitat types on the Right of Way, and (e) well documented, by this report and by voucher specimens to be deposited at Rancho Santa Ana Botanic Garden. Locations of special-status plants will be reported to the NDDB.

Spring 2010 surveys for special-status plants were conducted concurrently with desert tortoise surveys, along belt transects spaced at 10 meter intervals over 100 percent of the larger ROW parcel. AMEC botanist Shari Norton accompanied tortoise biologists, and documented all plant species observed throughout the survey period (AMEC 2011a). This field method combines the BLM's (2009) two

Special-Status Plant Species	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Senna covesii</i> (<i>Cassia covesii</i>) Coves's cassia	Low, mostly herbaceous perennial; desert washes below about 2000 ft. elev.; Colorado Des to Nevada, Arizona and Baja Calif. [ranked S1 in CDFG 2011, corrected as S2 by pers. communic. with R. Bittman, CDFG, 21 Sep 2011]	April - June	Fed: none BLM: NECO Calif: S2 CRPR: 2.2	Low - moderate; habitat may be suitable, but not seen during field surveys
<i>Stylocline sonorensis</i> Mesquite neststraw	Annual; known from only one record, near Hayfields Dry Lake, now presumed extirpated; occurs in SE Arizona and mainl. Mexico	April	Fed: none BLM: NECO Calif: SX CRPR: 1A	Minimal due to apparent extirpation
<i>Teucrium cubense</i> ssp. <i>depressum</i> Dwarf germander	Annual or perennial herb; sandy alluvium, washes, etc., below about 1300 ft. elev., scattered Sonoran Desert locations, to Texas and Baja Calif.	March - May	Fed: none BLM: none Calif: S2 CRPR: 2.2	Low - moderate; habitat may be suitable, but not seen during field surveys
<i>Wislizenia refracta</i> ssp. <i>palmeri</i> Jackass-clover	Perennial herb or subshrub; sand flats, washes, roadsides, saltbush scrub; scattered Calif. desert locations eastward to New Mexico, sea level to about 1000 ft. elev.	April - Nov.	Fed: none BLM: NECO Calif: S 2? CRPR: 2.2	High potential on gen-tie Alt E; low potential, washes or roadsides; otherwise not expected

General references (botany): Baldwin et al. 2002; Calif. Dept. of Fish & Game 2011, Calif. Native Plant Society 2011; Consortium of California Herbaria 2011; Felger 2000; Munz 1974; Shreve and Wiggins 1964; Turner et al. 1995; USFWS 2010b.

Conservation Status

Federal designations: (federal ESA, USFWS).

END: Federally listed, endangered.

THR: Federally listed, threatened.

Candidate: Sufficient data are available to support federal listing, but not yet listed.

Proposed: Formally proposed for federal status shown.

Bureau of Land Management Designations:

Sensitive: Species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA. BLM Sensitive species also include all federal Candidate species and federal Delisted species which were so designated within the last 5 years, and CRPR 1B plant species that occur on BLM lands.

NECO: Special-status species addressed in the NECO Plan/EIS due to management concerns within the NECO Planning Area.

State designations: (CESA, CDFG)

END: State listed, endangered.

THR: State listed, threatened.

RARE: State listed as rare (applied only to certain plants).

SSC: California species of special concern. Considered vulnerable to extinction due to declining numbers, limited geographic ranges, or ongoing threats.

FP: Fully protected. May not be taken or possessed without permit from CDFG.

CDFG Natural Diversity Data Base Designations: Applied to special-status plants and sensitive plant communities; where correct category is uncertain, CDFG uses two categories or question marks.

S1: Fewer than 6 occurrences or fewer than 1000 individuals or less than 2000 acres.

S1.1: Very threatened

S1.2: Threatened

S1.3: No current threats known

S2: 6-20 occurrences or 1000-3000 individuals or 2000-10,000 acres (decimal suffixes same as above).

S3: 21-100 occurrences or 3000-10,000 individuals or 10,000-50,000 acres (decimal suffixes same as above).

Special-Status Plant Species	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Ditaxis californica</i> (<i>D. serrata</i> var. <i>californica</i>) California ditaxis	Perennial herb; washes and canyons, low desert and adj. mtns.; La Quinta E to Desert Center, also Anza Borrego; about 100-3250 ft. elev.	March - Dec	Fed: none BLM: NECO Calif: S2 CRPR: List 3.2	Low - moderate; habitat is suitable, but not seen during field surveys
<i>Eriastrum harwoodii</i> Harwood's woollystar	Annual; partially stabilized desert dunes (San Bernardino, Riverside, and San Diego cos.); about 900 ft. to about 1700 ft. elev.	Mar-June	Fed: USFWS none BLM: Sensitive Calif: S2 CRPR: 1B.2	High potential on gen-tie Alt E; low potential, washes or roadsides; otherwise not expected
<i>Escobaria</i> – see <i>Coryphantha</i>				
<i>Euphorbia</i> – see <i>Chamaesyce</i>				
<i>Grusonia parishii</i> (<i>Opuntia parishii</i>) Parish's club-cholla	Stem-succulent; rocky desert shrublands, East Mojave Desert, JTNP, foothills above Coachella and Chuckwalla valleys; about 1000 – 5000 ft. elev.	May - July	Fed: none BLM: none Calif: S2 CRPR: 2.2	Low; field survey results; bajada site may be unsuitable habitat
<i>Koeberlinia spinosa</i> var. <i>tenuispina</i> Slender-spined allthorn	Deciduous shrub; desert shrublands and washes, below about 1700 ft. elev.; central Sonoran Desert, Imperial and Riverside cos; reported on-site in CNDDb, apparently based on misidentified <i>Castela emoryi</i>	May – July	Fed: none BLM: NECO Calif: S2.2 CRPR: 2.2	Low potential, not seen during field surveys ; see text
<i>Matelea parvifolia</i> Spearleaf	Low twining vine; rocky sites in desert shrublands, central and eastern deserts and Anza-Borrego State Park; S Nev., Texas, and Baja; about 1400-3600 ft. elev.	March - May	Fed: none BLM: NECO Calif: S2.2 CRPR: 2.3	Low potential, not seen during field surveys
<i>Opuntia</i> – also see <i>Grusonia</i>				
<i>Opuntia wigginsii</i> Wiggins cholla	Cactus; doubtful taxon; probably a hybrid (<i>O. ramissima</i> x <i>echinocarpa</i>), desert shrubland about 100-3000 ft. elev., scattered Colorado Des. sites, east to Arizona	March	Fed: none BLM: NECO Calif: S1? CRPR: 3.3	Low potential, not seen during field surveys
<i>Proboscidea althaeifolia</i> Desert unicorn-plant	Perennial herb; generally sandy soils, desert shrubland, about 500-3300 ft. elev.; Sonoran Desert to Arizona and Mexico	May - Aug	Fed: none BLM: NECO Calif: S3.3 CRPR: 4.3	Occurs
<i>Salvia greatae</i> Orocopia sage	Shrub; desert shrubland, washes and alluvial fans, about 100-2800 ft. elev.; Riverside & Imperial cos, endemic to Orocopia Mtns and Chocolate Mtns (doubtful report near Cadiz, San Bernardino Co)	March - April	Fed: none BLM: Sensitive, NECO Calif: S2 CRPR: 1B.3	Low - moderate; habitat may be suitable, but not seen during field surveys
<i>Selaginella eremophila</i> Desert spike-moss	Perennial herb; mountainous or hillside rock outcrops and crevices, about 600 - 3000 ft. elev.; lower desert-facing slopes of San Jacinto Mtns and adj. desert, to Texas and Baja	n/a	Fed: none BLM: none Calif: S 2.2? CRPR: 2.2	Minimal (no suitable habitat)

Special-Status Plant Species	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Astragalus insularis</i> var. <i>harwoodii</i> Harwood's milk vetch	Annual; sand, mainly dunes, also washes and slopes; below about 1200 ft. elev.; SE Calif. to Ariz., Baja and Sonora	Jan. - May	Fed: none BLM: NECO Calif: S2.2? CRPR: 2.2	High potential on gen-tie Alt E; low potential, washes or roadsides; otherwise not expected
<i>Astragalus lentiginosus</i> var. <i>coachellae</i> Coachella Valley milk-vetch	Annual or perennial herb; open sand, gen. dunes but also wash margins; below about 2200 ft. elev.; endemic to Coachella Valley; formerly reported from Chuckwalla Valley, those populations now recognized as <i>A. l.</i> var. <i>variabilis</i> (speckled milk-vetch)	Feb. - May	Fed: END BLM: Sensitive, NECO Calif: S2.1 CRPR: 1B.2	Minimal; outside geographic range
<i>Ayenia compacta</i> Ayenia	Perennial herb; desert shrubland, gen. rocky sites, washes and mountain slopes below about 3600 ft. elev.; W low desert margins, Chuckwalla Valley, and E Mojave; also Baja Calif. and Sonora (Mexico)	March - April	Fed: none BLM: none Calif: S3? CRPR: 2.3	Low-moderate. Washes are marginally suitable; not seen during field surveys.
<i>Cassia</i> – see <i>Senna</i>				
<i>Castela emoryi</i> Crucifixion thorn	Shrub; widespread but rare, Calif. deserts to Ariz., Baja and Sonora; fine sand or silt, washes, plains, non-saline bottomlands, about 350-2100 ft. elev.	June-July	Fed: none BLM: NECO Calif: S2/S3 CRPR: 2.3	Occurs; see text
<i>Chamaesyce abramsiana</i> (<i>Euphorbia abramsiana</i>) Abrams' spurge	Annual; sandy flats; about sea level to 3,000 ft. elev.; East Mojave desert, JTNP, and low desert, to Arizona and Mexico		Fed: none BLM: none Calif: S1.2 CRPR: 2.2	Potential on gen-tie Alt E; low potential, washes or roadsides; otherwise not expected
<i>Colubrina californica</i> Las Animas colubrina	Shrub; scattered mtn ranges of the low desert, incl. JTNP, Eagle Mtns, Chuckwalla Mtns, etc.; about 1100-3900 ft. elev.; rare in Calif., more common in Ariz. and Mexico	April - May	Fed: none BLM: NECO Calif: S2/S3.3 CRPR: 2.3	Low; field survey results
<i>Coryphantha alversonii</i> (<i>C. vivipara</i> var. <i>alversonii</i> ; <i>Escobaria vivipara</i> var. <i>alversonii</i>) Alverson's foxtail cactus	Cactus; desert scrub, S Mojave and Sonoran Deserts, about 250-5000 ft. elev.; Riverside, San Bernardino, and Imperial cos., to Arizona	May - June	Fed: none BLM: NECO Calif: S3.2 CRPR: 4.3	Low; field survey results; bajada site may be unsuitable habitat
<i>Cynanchum utahense</i> (<i>Funastrum utahense</i>) Utah vine milkweed	Climbing perennial herb; sandy or gravelly soils, E and S Mojave Des through JTNP and Anza-Borrego regions, to S Nevada, NW Ariz., and SW Utah; about 500 - 4700 ft. elev.	April-June	Fed: none BLM: none Calif: S3.2 CRPR: List 4.2	Occurs - reported spring 2010 (one indiv.) not relocated in 2011
<i>Ditaxis claryana</i> (<i>D. adenophora</i>) Glandular ditaxis	Perennial herb. Conflicting info. in literature. Sandy soils below about 350 ft. elev.; or rocky uplands & sandy washes to 3000 ft.; widely scattered, Sonoran Desert, Calif. to Ariz. and mainland Mexico	conflicting lit. reports	Fed: none BLM: NECO Calif: S1/S2 CRPR: 2.2	Low - moderate; habitat may be suitable, but not seen during field surveys

- Recent environmental documents for nearby projects including the adjacent Desert Sunlight Solar Farm Project (BLM 2011b), the Palen Solar Power Project (BLM 2011c), and the Genesis Solar Energy Project (BLM 2011d).

Based upon review of the literature and database above, and AMEC's consultation with Andrew C. Sanders (University of California Riverside Herbarium), a list of special-status plant species with potential to occur in the vicinity of the proposed project was compiled. Plant taxa were considered to be special-status species if they were classified as one or more of the following:

- Listed, proposed for listing, or candidates for listing as threatened or endangered under the federal Endangered Species Act (ESA);
- Listed as threatened or endangered, or candidates for listing under the California Endangered Species Act (CESA);
- Designated by BLM as Sensitive Plants: "all plant species that are currently on List 1B of the CNPS Inventory of Rare and Endangered Plants of California, are BLM sensitive species, along with others that have been designated by the California State Director" (BLM 2009; note that the CNPS Lists are now known as California Rare Plant Ranks, or CRPR);
- Listed as rare under the California Native Plant Protection Act;
- Meet the definition of rare or endangered under CEQA §15380(b) and (d).
- Considered special-status species in local or regional plans, policies, or regulations, such as the NECO Plan/EIS.

Table 3 presents the special-status plant species known from the region and summarizes their natural history, agency status, and probability of occurrence on the project site. See also Figure 3 in AMEC (2011a), which maps documented occurrences of special-status plant species that are known from the vicinity. No BLM Sensitive Species or CRPR 1B species are known from the project vicinity.

Table 3. Special-Status Plants of the Chuckwalla Valley Area.

Special-Status Plant Species	Habitat and Distribution	Flower season	Conservation Status	Occurrence Probability
<i>Abronia villosa</i> var. <i>aurita</i> Chaparral sand verberna	Annual or perennial herb; sand, about 250-5300 ft. elev.; San Jacinto Mtns, Inland Empire, adj. Colorado Des, Orange & San Diego cos; mostly alluvial fans and benches in western Riverside Co; dunes in deserts; not rare in the deserts	Feb. - July	Fed: none BLM: Sensitive Calif: S2 CRPR: 1B.1	High potential on gen-tie Alt E; low potential, washes or roadsides; otherwise not expected
<i>Ammoselinium giganteum</i> Desert sand-parsley	Annual; only known Calif. location at Hayfields Dry Lake, about 1300 ft. elev.; heavy soils, beneath shrubs; also to AZ and Mainl. Northern Mexico	March - April	Fed: none BLM: none Calif: SH CRPR: 2.3	Minimal; no suitable dry lakebed habitat
<i>Androstephium breviflorum</i> Pink funnel-lily, small-flowered androstephium	Bulb; Mojave Des shrublands; stabilized dunes or sandfields, about 700-5300 ft. elev.; scattered in Calif., N Ariz., S Nevada, to W Colorado	March-April	Fed: none BLM: none Calif: S2/S3 CRPR: 2.3	Minimal; no suitable habitat

Season/project component	Date	Field Staff
Spring surveys, DHSP site (larger parcel)	12 Apr 2010	AMEC staff: JB, BF, SF, MO, DS, AH, NM, SN
	13 Apr 2010	AMEC staff: JB, BF, SF, MO, DS, AH, NM, SN
	14 Apr 2010	AMEC staff: JB, BF, SF, MO, DS, AH, NM, SN
	15 Apr 2010	AMEC staff: JB, SF, MO, DS, AH, SN, MW
	16 Apr 2010	AMEC staff: JB, BF, SF, MO, DS, AH, SN, MW
	17 Apr 2010	AMEC staff: JB, BF, SF, MO, DS, AH
	7 May 2010	AMEC staff: NM, SN
Fall surveys, DHSP site (both parcels)	21 Oct 2010	Aspen staff: Justin Wood, Dustin Ray
	22 Oct 2010	Aspen staff: Justin Wood, Dustin Ray
	1 Nov 2010	Aspen staff: Justin Wood, Dustin Ray
	2 Nov 2010	Aspen staff: Justin Wood, Dustin Ray
Spring surveys, DHSP site (smaller parcel)	15 Apr 2011	Aspen staff: Justin Wood, Dustin Ray
	16 Apr 2011	Aspen staff: Justin Wood, Dustin Ray
Fall surveys, gen-tie Alternative E	5 Oct 2011	Justin Wood, Jared Varonin
	13 Oct 2011	Aspen staff: Justin Wood, Dustin Ray
	14 Oct 2011	Aspen staff: Justin Wood, Dustin Ray

The spring 2010 botanical surveys were conducted in a year of higher than average rainfall at the site. Average annual precipitation recorded at the Eagle Mountain weather station is 3.68 inches (9.35 cm), while the total rainfall for the 2009-2010 rainfall year (July 1 through June 30) was 5.37 in (13.6 cm). Thus, the results of the spring 2010 surveys should represent a large proportion of floristic diversity on the site. However, BLM and CDFG also recommend late-season botanical surveys on desert sites, particularly in the eastern California deserts. The distribution and abundance of many fall-flowering species in the California desert is incompletely documented in literature due to a historic emphasis on spring, rather than fall, field work. Yet a significant proportion of the flora is made up of annual species that germinate in response to summer rains, or perennial herbs that may flower at any time of year, depending on rainfall (Shreve and Wiggins 1964; Phillips and Comus 2000). Therefore, additional late-season field surveys were conducted to find and identify as many species as possible, to maximize the likelihood that species not known from the area, or not included on a list of "target species" would be documented if they occur on the site. This approach to field work conforms to CDFG (2009) and BLM (2009) guidelines recommending "floristic" botanical surveys and provides the most thorough practicable botanical inventory of the Right of Way Application.

Prior to field surveys, AMEC and Aspen biologists reviewed available literature to identify special-status biological resources known from the vicinity of the project site. The literature and databases listed below were reviewed. For data sources that are regularly updated, such as the CNDDDB and CNPS records, AMEC and Aspen biologists reviewed the available data several times during the course of the project. Only the most recent citations are included below.

- CNDDDB (CDFG 2011a) for the following 7½-minute USGS topographic quads: Victory Pass, East of Victory Pass, Desert Center, Corn Spring, Coxcomb Mountains, Pinto Wells, Placer Canyon, Buzzard Spring, Hayfield Spring, West of Palen Pass, Palen Lake, and Sidewinder Well;
- CNPS Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2011), for the same topographic quads;
- NECO Plan (BLM and CDFG 2002);
- List of California BLM Sensitive Plants (BLM 2010a);

bush and Russian thistle (*Salsola* sp.). None of this habitat would be affected by solar generator construction, and only generator tie-line Alternative E would affect it. Impacts acreage would be dependent on the specific locations of access roads, transmission line structures, and work sites.

State Jurisdictional Streambed Delineation

The CDFG regulates alterations to state-jurisdictional streambeds under Section 1600 et seq. of the California Fish and Game Code. Jurisdictional acreage is interpreted as the bed and banks of channels and adjacent riparian vegetation. In the Chuckwalla Valley area, the Blue Palo Verde - Ironwood Woodland (described above; see Figure 3) is the regional riparian vegetation type. Due to the abundance and close spacing of braided channels throughout the area, all mapped Blue Palo Verde-Ironwood Woodland is adjacent to one or more channels. The CDFG jurisdictional streambeds are mapped on Figure 5. Note that roads crossing the site often intercept running water from channels, so that the roads themselves become streambeds as defined by CDFG. These roads account for the a few mapped streambeds that do not follow the general topography. Construction of the project would impact 113 acres of state-jurisdictional streambeds (34.5 acres within Blue Palo Verde-Ironwood Woodland, and 78.5 acres within Creosote Bush Scrub). Construction would also impact 180 acres of the adjacent riparian vegetation (Blue Palo Verde-Desert Ironwood Woodlands). Total impacts to jurisdictional areas are calculated as the sum of mapped woodlands (180 acres) plus the acreage of jurisdictional streambeds mapped outside those woodlands (78.5 acres), or 258.5 acres total within the proposed solar generator site. Each of the generator tie-line alternatives would affect a limited additional acreage of state-jurisdictional streambeds or woodland vegetation, depending on the specific locations of access roads, transmission line structures, and work sites.

SPECIAL-STATUS SPECIES

Methods

Special-Status Plants

Field surveys for special-status plants have been conducted during spring and fall throughout the proposed DHSP site, and during fall along gen-tie Alternative E. Botanical surveys on the other gen-tie alternative alignments were conducted for the Desert Sunlight EIS, and this BRTR adopts those survey results. Follow-up spring botanical surveys of gen-tie Alternative E will be completed during spring 2012.

Surveys were conducted throughout the larger, northwestern parcel by AMEC during spring 2010; throughout both parcels by Aspen biologists Justin Wood and Dustin Ray during fall 2010; throughout the smaller southwestern parcel by Wood and Ray during spring 2011; and along the eastern generator tie-line alignment (Alternative E) by Wood, Ray, and Aspen biologist Jared Varonin during fall 2011. In addition, incidental observations of flora, including special-status species, were recorded during all field work for the vegetation, habitat, and jurisdictional wetlands, described above. The following descriptions of methods and results of botanical surveys are summarized from AMEC's botanical report (2011a), with additional information from Aspen's field work.

Table 2. Botanical Survey Aspen Field Survey Staff and Field Dates (AMEC field survey staff and dates reported in Appendix (AMEC 2011a; 2011b).

Season/project component	Date	Field Staff
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Creosote Bush Scrub on the site matches the Desert Scrub wildlife habitat described by Laudenslayer and Boggs (1988). Within the project area, it provides habitat for wildlife species typical of the California deserts, including burrowing species such as kangaroo rats (*Dipodomys* spp.), pocket mice (*Perognathus* and *Chaetodipus* spp.), and desert cottontail (*Sylvilagus audubonii*); and mesopredators such as desert kit fox (*Vulpes macrotis arsipus*) and coyote (*Canis latrans*). This community also serves as habitat for numerous species of reptiles including desert iguana (*Dipsosaurus dorsalis*), sidewinder (*Crotalus cerastes*), desert horned lizard (*Phrynosoma platyrhinos*), Great Basin whiptail (*Aspidocelis tigris tigris*) and zebra-tailed lizard (*Callisaurus draconoides*). Common birds observed within this vegetation included black-throated sparrow (*Amphispiza bilineata*), Gambel's quail (*Callipepla gambelii*), common raven (*Corvus corax*), red-tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*).

Blue Palo Verde-Ironwood Woodland: Blue Palo Verde-Ironwood Woodland occurs throughout the project area primarily in dry washes and is characterized by the presence of desert ironwood (*Olneya tesota*) and blue palo verde (*Parkinsonia florida*). Additional tree species such as smoketree (*Psoralea spinosa*) and cat claw acacia (*Acacia greggii*) also occur but are uncommon. This vegetation is one of several communities included within broader vegetation types called desert wash woodland or microphyll woodland (Holland 1986; Schoenherr and Burk 2007). Vegetation in desert washes is generally taller, up to approximately 9m (30 ft) in height, and denser than in surrounding desert habitats, with the height of the wash vegetation proportional to the size of the arroyo (Laudenslayer 1988). Understory vegetation within these woodlands is composed of big galleta, cheesebush (*Hymenoclea salsola*), desert lavender (*Hyptis emoryi*) and other shrubs and subshrubs. Blue Palo Verde-Ironwood Woodlands on the site match the desert wash wildlife habitat described by Laudenslayer (1988). This habitat provides greater food, nesting, and cover resources than the surrounding Creosote Bush Scrub, and wildlife diversity is generally greater than in the surrounding desert. Examples of species that depend in part on desert microphyll woodlands include vermilion flycatcher (*Pyrocephalus rubinus*), black-tailed gnatcatcher (*Poliophtila melanura*), and burro deer (*Odocoileus hemionus eremicus*) (below). In addition, many of the species occupying the surrounding Creosote Bush Scrub are found in greater numbers in microphyll woodlands. This community is ranked by CDFG (2010a) as a special-status vegetation type, with state rarity ranking of S3. We mapped 180 acres of Blue Palo Verde –Ironwood Woodland on the proposed solar project site. Each of the generator tie-line alternatives would affect a limited additional acreage of this woodland vegetation, depending on the specific locations of access roads, transmission line structures, and work sites.

Creosote Bush Scrub on Partially Stabilized Sand Fields: Creosote Bush Scrub vegetation occurs on partially stabilized sand fields in the eastern portion of gen-tie Alternative E. This area is located at the western margin of a much larger dune system associated with Pinto Wash, at the base of the Coxcomb Mountains. This vegetation matches the description of Creosote Bush Scrub, above, but the cover is much sparser and the substrate consists of partially stabilized sand fields with accumulations of sands mounded at the bases of the shrubs. This habitat type is suitable for a series of special-status plants and animals, including Mojave fringe-toed lizard, which were reported in the area in the Desert Sunlight EIS and observed there by Aspen field staff. None of this habitat would be affected by solar generator construction, and only generator tie-line Alternative E would affect it. Acreage impacted by Alternative E would be dependent on the specific locations of access roads, transmission line structures, and work sites.

Active Sand Dunes: Active sand dunes are found in the eastern portion of the project area on gen-tie Alternative E. These dunes are at the western margin of the larger Pinto Wash / Coxcomb Mountains dune system, above. This habitat type is characterized by fine aeolian (i.e., wind-blown) sands that support very little vegetation. Vegetation on the dunes is sparse, but dominated by scattered creosote

Any vegetation map is subject to imprecision for several reasons:

1. Vegetation types intergrade on the landscape so that there are no true boundaries in the vegetation itself. In these cases, a mapped boundary represents best professional judgment.
2. The published nomenclature and descriptions tend to intergrade; that is, a given stand of vegetation may not match any named type in the classification scheme used. Each polygon is labeled according to the most applicable type in the classification, but there is often some ambiguity among the types.
3. Vegetation tends to be patchy. Small patches of one type are often surrounded by another type. The size of these included patches varies, depending on the minimum mapping units and scale of available aerial imagery.
4. Photo interpretation of visually similar vegetation types may be difficult.

Results

Vegetation

Two vegetation types cover the proposed solar generator site and generator tie-line Alternatives B, C, and D (Figures 3 and 4): Creosote Bush Scrub (*Larrea tridentata* Shrubland Alliance) and Blue Palo Verde-Ironwood Woodland (*Parkinsonia florida*-*Olneya tesota* Woodland Alliance) (Sawyer et al. 2009). The Creosote Bush Scrub vegetation is a subset of the Sonoran Creosote Bush Scrub as described by Holland (1986), and Blue Palo-Verde-Ironwood Woodland is a subset of his description of Desert Dry Wash Woodland. There also are small areas within the proposed solar generator site where natural vegetation has been removed or disturbed for roads and other land uses. In most cases (e.g., narrow roads), these areas are too small for mapping at this scale; however, the proposed solar generator site overlaps a narrow area disturbed for date palm agriculture (on an adjacent parcel) in the southeastern corner of the site. This area is mapped as "Disturbed / Disused Agriculture" on Figures 3 and 4. There also are additional disturbed areas along the generator tie-line alignments, particularly alignment Alternative D, which crosses disused agricultural lands over part of its length.

Generator tie-line alignment Alternative E, located farther to the east, crosses two additional vegetation or habitat types: active sand dunes and Creosote Bush Scrub on partially stabilized sand fields (Figure 4).

Creosote Bush Scrub (bajada/alluvial landforms): Creosote Bush Scrub on the site is characterized by low shrub species diversity and relatively wide spacing of shrubs, usually with bare ground between. The dominant species in this vegetation is creosote bush (*Larrea tridentata*). Associated species include white bursage (*Ambrosia dumosa*), brittlebush (*Encelia farinosa*), and big galleta (*Pleuraphis rigida*). This vegetation also supports a diverse assemblage of seasonal annuals, including desert sunflower (*Geraea canescens*), desert dandelion (*Malacothrix glabrata*), several pincushion species (*Chaenactis* spp.) and several species of cryptantha (*Cryptantha* spp.). The areas mapped as Creosote Bush Scrub also include areas of desert pavement with relatively sparse cover of low-statured creosote bush and seasonal annuals such as devil's spineflower (*Chorizanthe rigida*), kidneyleaf buckwheat (*Eriogonum reniforme*), and Emory's rock daisy (*Perityle emoryi*). We mapped 1,026 acres of Creosote Bush Scrub on the proposed solar project site. Creosote Bush Scrub has no California Department of Fish and Game special-status designation (CDFG 2010a). Each of the generator tie-line alternatives would affect a limited additional acreage of Creosote Bush Scrub, depending on the specific locations of access roads, transmission line structures, and work sites.

VEGETATION, HABITAT, AND JURISDICTIONAL STREAMBEDS

Methods

Aspen biologists Justin Wood, Jared Varonin, and Dustin Ray mapped streambeds and vegetation on the proposed solar generator site during September and October 2011. Vegetation mapping and delineations of the gen-tie alignment Alternatives B, C, and D are based on the Desert Sunlight EIS and supporting documents. These three alignments conform to gen-tie line Alternatives A-1 and A-2, described and analyzed for the Desert Sunlight Solar Project (BLM 2011a). Aspen biologists reviewed these alignments in the field to review the prior mapping and descriptions, and to identify any substantial changes that may have taken place. Based on this field verification, the discussion of vegetation on gen-tie alignment Alternatives B and C is based on the Desert Sunlight Solar Project data. Vegetation mapping of gen-tie alignment Alternative E was completed by Aspen biologists in October 2011, but the jurisdictional delineation of gen-tie alignment Alternative E has not yet been completed.

Table 1. Vegetation, Habitat, and Jurisdictional Streambed Field Survey Staff and Field Dates.

Date	Field Staff
8 Sep 2011	Justin Wood, Dustin Ray
9 Sep 2011	Justin Wood, Dustin Ray
19 Sep 2011	Justin Wood, Jared Varonin
20 Sep 2011	Justin Wood, Jared Varonin
26 Sep 2011	Jared Varonin, Dustin Ray
27 Sep 2011	Jared Varonin, Dustin Ray
28 Sep 2011	Jared Varonin, Dustin Ray
4 Oct 2011	Justin Wood, Jared Varonin, Dustin Ray, Scott White
5 Oct 2011	Justin Wood, Jared Varonin

Prior to beginning field work, Ray mapped visible streambeds on USDA 2009 and 2010 NAIP Imagery (<http://datagateway.nrcs.usda.gov/GDGHHome.aspx>), resolution of 1 square meter (i.e. the pixels are 1m x 1m) as Geographic Information System (GIS) shapefiles. Streambeds were delineated by field-verifying presence and widths of each channel, and then refining the mapped data. During the initial site visits (8 and 9 September 2011), Wood and Ray collected channel width and depth data at a series of "sample" streambeds within a portion of the site. Based on these field observations, Ray mapped all streambeds, and added channel widths to the data set. This method was repeated throughout the proposed solar generator site. The total jurisdictional streambed acreage was calculated as the summed area of jurisdictional channels (i.e., summed length x width of all channels) plus the acreage of adjacent riparian vegetation.

Vegetation was mapped with a minimum mapping unit of about 0.15 acres (6,500 square feet) by comparing vegetation on the proposed solar generator site to aerial imagery (above) during an initial site visit (8 and 9 September 2011) to identify dominant species and determine the extent that they could be distinguished on the image. Based on this field visit, Ray mapped vegetation as a separate GIS shapefile. The vegetation map and text descriptions (below) were field verified during follow-up field visits, while walking field transects and by visiting specific points, in conjunction with streambed delineation. All GIS information was digitized in the NAD 83 datum using the California State Plane Zone VI projection to ensure local accuracy when calculating area.

SUMMARY OF FIELD SURVEYS

This Biological Resources Technical Report (BRTR) summarizes the results of field surveys provided in prior reports, as well as literature review and additional field work conducted by Aspen Environmental Group (Aspen) biologists. The reports and field surveys summarized in this BRTR are listed below.

- Streambed Delineation and Vegetation Map: Aspen biologists Justin Wood, Jared Varonin, and Dustin Ray mapped streambeds and vegetation on the proposed solar generator site during September and October 2011. The methods and results, including maps and text descriptions of vegetation and habitat, are incorporated into this BRTR. Vegetation mapping and delineations of the gen-tie alignment Alternatives B, C, and D are based on the Desert Sunlight EIS and supporting documents. Vegetation mapping of gen-tie alignment Alternative E was completed by Aspen biologists in October 2011, but delineation of gen-tie alignment Alternative E has not yet been completed.
- Special-Status Plant Surveys: Spring and fall field surveys for special-status plants were conducted during 2010 and 2011 by AMEC Earth and Environmental, Inc. (AMEC) and Aspen biologists. The descriptions of methods and results of botanical surveys in this BRTR are summarized from AMEC's botanical report (2011a), with additional information from Aspen's independent field work.
- Desert Tortoise Surveys: Focused surveys for desert tortoise were conducted over 100% of the larger, northeastern parcel during spring 2010 (AMEC 2011b) and the smaller, southwestern parcel in spring 2011 (AMEC 2011c), as well as within the adjacent buffer zone, in accordance with US Fish and Wildlife Service (USFWS) survey protocol (2010a).
- Mojave Fringe-toed Lizard Habitat Evaluation: Herpetologist Robert Black evaluated habitat throughout the solar generator site for Mojave fringe-toed lizard habitat suitability (Black 2011).
- Avian Point-Count Surveys: AMEC conducted avian point count surveys during winter and spring of 2011 to comply with BLM requirements (2009). Winter season point counts were conducted during January 2011, and breeding season point counts were between March 30 and April 28, 2011 (AMEC 2011d).
- Generator Tie-line Alignments: Field surveys have been completed on the alignments for Alternatives B, C, and D, as described in the Desert Sunlight EIS and supporting documents. Note that the 400-foot survey corridor described for that project covered the widths of both Alternatives B and C as addressed here. Field surveys of gen-tie alignment Alternative E were begun in 2011 (vegetation mapping and fall botanical surveys) and are ongoing.

In addition to these field surveys and reports, Aspen and AMEC biologists reviewed the California Natural Diversity Data Base (CNDDB; California Department of Fish and Game, CDFG 2011) and California Native Plant Society (CNPS) Electronic Inventory (2011) to identify special-status plants, animals, and plant communities known from the area. The CNDDB report is included here as Attachment 1. We also reviewed applicable documents pertaining to the Desert Sunlight project, including the vegetation and wildlife sections of the EIS (BLM 2011a), the BRTR (Ironwood Consulting 2010), and the Biological Opinion (USFWS 2011b). During all field surveys conducted for the Desert Harvest project, all plant and animal species observed in the field were identified and recorded in field notes. A cumulative list of all plant and animal species noted on the site is included here as Attachment 2.

PROJECT OVERVIEW

The Desert Harvest Solar Project (DHSP) site is located in the upper Chuckwalla Valley, on public lands administered by the Bureau of Land Management (BLM) in unincorporated Riverside County, approximately 6 miles north of Desert Center, California (Township 4 South, Range 15 East, Sections 25, 26, 27, USGS 7.5' Victory Pass and East of Victory Pass quadrangles). The Right-of-Way Application consists of two non-contiguous parcels (Figure 1). The large, northeastern parcel is 1,070 acres and the smaller, southwestern parcel is 270 acres. Portions of each parcel extend to the west of Kaiser Road (County Route R2); enXco does not propose to construct solar facilities within the Kaiser Road right of way, or west of Kaiser Road. With these areas excluded from the analysis, the total area addressed in this report is approximately 1,208 acres, consisting of 1051 acres in the larger parcel, and 157 acres in the smaller one.

The Project site is now undeveloped, natural open space. The surrounding area consists primarily of public lands managed by the BLM, with scattered smaller private land parcels to the south and east. The Desert Sunlight Solar Project, now under construction, is located to the immediate north of the Desert Harvest site (Figure 2). The Desert Sunlight project was recently approved (BLM 2011a; 2011b) and will occupy 3,761 acres when fully built out. Public lands to the west of Kaiser Road, adjacent to the Desert Harvest site, are within a BLM Desert Wildlife Management Area (DWMA), designated in the Northern & Eastern Colorado Desert Coordinated Management Plan (NECO; BLM and CDFG 2002). The Palen-Ford WHMA, also designated in the NECO, is generally east of the site, but approximately 46 acres of the WHMA are within the project site (see Figure 6). Some of the private lands to the south and west have been developed as residential and agricultural lands uses. These include active and inactive jojoba fields, rural residential lands, and the community of Lake Tamarisk.

Joshua Tree National Park (JTNP) surrounds the upper Chuckwalla Valley on the north, east, and west. To the north, the JTNP boundary is about 7 miles from the northern boundary of the Desert Harvest ROW, and about 4.5 miles north of the approved Desert Sunlight project boundary. The Coxcomb Mountains, in the southeastern corner of JTNP, are located about 1.8 miles northeast of the northeastern corner of the Desert Harvest ROW. To the west, the JTNP boundary is about 3.5 miles from the western boundary of the Desert Harvest site, at Kaiser Road.

In addition to the proposed solar generator, this report addresses four alternate generator tie-line (gen-tie) alignments which would deliver electrical power from the Desert Harvest project site to Southern California Edison's Red Bluff Substation, now under construction. The alternative alignments are shown on Figure 2.

- The Applicant's proposed generator tie-line would be on shared alignment and ROW with the approved Desert Sunlight gen-tie line, to be constructed on the same poles. This proposed alignment is described here and in the Project Environmental Impact Statement (EIS) as Alternative B. This alignment was described in the Desert Sunlight EIS (BLM 2011a) as Alternative A-1.
- Gen-tie alignment Alternative C would be parallel to the Desert Sunlight gen-tie, on separate poles, but within the same ROW. This alignment was also described in the Desert Sunlight EIS as Alternative A-1.
- Gen-tie alignment Alternative D, or the cross-valley alignment, was described in the Desert Sunlight EIS as Alternative A-2.
- Gen-tie alignment Alternative E was not reviewed in the Desert Sunlight EIS.

ACRONYMS AND ABBREVIATIONS

Area of Critical Environmental Concern	ACEC
AMEC Earth & Environmental, Inc.	AMEC
Aspen Environmental Group	Aspen
Bald and Golden Eagle Protection Act	BGEPA
Bureau of Land Management	BLM
Biological Resources Technical Report	BRTR
California Burrowing Owl Consortium	CBOC
California Department of Fish and Game	CDFG
California Environmental Quality Act	CEQA
California Endangered Species Act	CESA
California Rare Plant Rank	CRPR
California Native Plant Society	CNPS
California Natural Diversity Data Base	CNDDDB
Centimeter	cm
Desert Harvest Solar Project	DHSP
Desert Wildlife Management Area	DWMA
Environmental Impact Statement	EIS
Federal Endangered Species Act	ESA or federal ESA
Generator tie-line	gen-tie
Geographic Information System	GIS
Global Positioning System	GPS
Inch	in
Joshua Tree National Park	JTNP
Meter	m
Migratory Bird Treaty Act	MBTA
Mile	Mi
National Agriculture Imagery Program	NAIP
National Environmental Policy Act	NEPA
North American Datum of 1983	NAD83
Northern & Eastern Colorado Desert Coordinated Management Plan	NECO
Record of Decision	ROD
Right-of-way	ROW
United States Department of Agriculture	USDA
United States Fish and Wildlife Service	USFWS
United States Geological Survey	USGS
University of California	UC
Western Regional Climate Center	WRCC
Wildlife Habitat Management Area	WHMA
Zone of influence	ZOI

Contents

ACRONYMS AND ABBREVIATIONS	1
PROJECT OVERVIEW.....	2
SUMMARY OF FIELD SURVEYS	3
VEGETATION, HABITAT, AND JURISDICTIONAL STREAMBEDS.....	4
METHODS	4
RESULTS	5
Vegetation.....	5
State Jurisdictional Streambed Delineation.....	7
SPECIAL-STATUS SPECIES	7
METHODS	7
Special-Status Plants	7
Special-Status Wildlife.....	14
RESULTS AND DISCUSSION	20
Listed Threatened or Endangered Plants	20
BLM Sensitive Plants	20
Other Special-Status Plants	21
Listed Threatened or Endangered Wildlife	23
Species Protected Under the Federal Bald and Golden Eagle Protection Act	26
Wildlife Species Fully Protected Under the California Fish and Game Code	28
BLM Sensitive Wildlife Species.....	28
Other Special-Status Wildlife Species	33
WILDLIFE MOVEMENT.....	35
NATIVE BIRDS: MIGRATORY BIRD TREATY ACT / CALIFORNIA FISH AND GAME CODE.....	37
LITERATURE CITED	38

Tables

Table 1 Vegetation, Habitat, and Jurisdictional Streambed Field Survey Staff and Field Dates.	4
Table 2 Botanical Survey Aspen Field Survey Staff and Field Dates.	7
Table 3 Special-Status Plants of the Chuckwalla Valley Area.	9
Table 4 Special-Status Wildlife of the Chuckwalla Valley Area.	15

Figures

Figure 1. Regional Map
Figure 2. Project and Vicinity
Figure 3. Vegetation and Special Status Plant Locations, DHSP Site
Figure 4. Vegetation and Special Status Plant Locations, Gen-tie Line Alignments
Figure 5. CDFG Jurisdictional Streambeds
Figure 6. Wildlife Management Areas
Figure 7. Special-Status Wildlife Locations, DHSP site
Figure 8. Special-Status Wildlife Locations: Gen-tie Line Alignments
Figure 9. Wildlife Habitat Connectivity
Photo Exhibit. Interstate-10 Wildlife Crossing Sites

Biological Resources Technical Report

Desert Harvest Solar Project

Prepared for:



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January, 2012

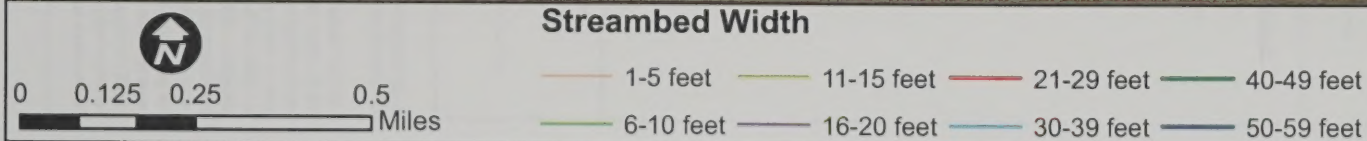
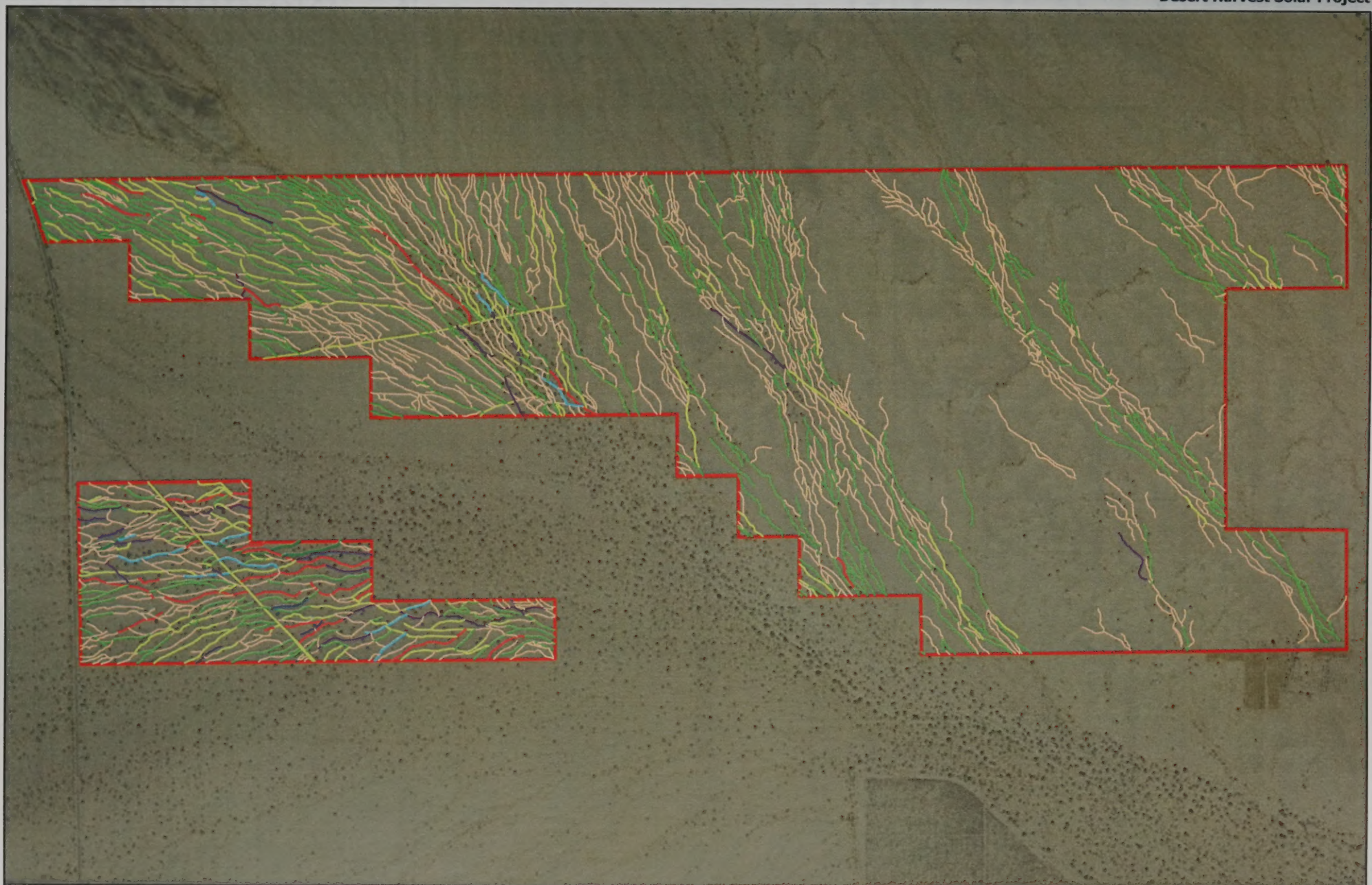


Figure 3.3-3

CDFG

Jurisdictional Streambeds

October 2011

October 2011

**Attachment 3 - Preliminary Jurisdictional
Determination Form**

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there "may be" waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

District Office	Los Angeles District	File/ORM #		PJD Date:	
State	CA	City/County	Desert Center/Riverside	Name/Address of Person Requesting PJD	Jared Varonin Aspen Environmental Group 5020 Chesebro Road, Suite 200 Agoura Hills, CA 91301 Consultant/Agent for Project Applicant
Nearest Waterbody:	Palen Dry Lake				
Location: TRS, Lat/Long or UTM:					
Identify (Estimate) Amount of Waters in the Review Area:			Name of Any Water Bodies on the Site Identified as Section 10 Waters:		
On-Wetland Waters:			Tidal: n/a		
Stream Flow:			Non-Tidal: n/a		
Linear ft: 0 width: 0 acres			Ephemeral		
Wetlands: 0 acre(s)			Cowardin Class: Riverine		
			☐ Office (Desk) Determination		
			☒ Field Determination: Date of Field Trip: Aug/Sep 2011		

REPORTING DATA: Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked requested, appropriately reference sources below):

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: CDFG Jurisdictional Waters Map
- ☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - ☐ Office concurs with data sheets/delineation report.
 - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps
- ☐ Corps navigable waters' study:
- ☒ U.S. Geological Survey Hydrologic Atlas:
 - ☒ USGS NHD data.
 - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s). Cite quad name:
- ☐ USDA Natural Resources Conservation Service Soil Survey. Citation:
- ☐ National wetlands inventory map(s). Cite name:
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is:
- ☐ Photographs: ☐ Aerial (Name & Date):
 - ☐ Other (Name & Date):
- ☒ Previous determination(s). File no. and date of response letter: Desert Sunlight Solar Project (different applicant)
- ☐ Other information (please specify):

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and Date of Regulatory Project Manager
(REQUIRED)

Signature and Date of Person Requesting Preliminary JD
(REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD declined to exercise the option to obtain an approved JD in this instance and at this time.

In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Appendix A - Sites

District Office	Los Angeles District	File/ORM #		PJD Date:	
State	CA	City/County	Desert Center/Riverside	Person Requesting PJD	

Site Number	Latitude	Longitude	Cowardin Class	Est. Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
1	33°47'42.61"N	115°23'21.57"W	Riverine	285.5 acres	non-wetland State waters

Notes:

Appendix C.12

Applicant Memo on Mitigation Land



TO: Ian Black, enXco
FROM: Brian Monaghan, Wildlands *Bri*
DATE: November 17, 2011
RE: Desert Harvest Solar Project, Riverside County

Thank you for the opportunity to work with enXco on providing a turnkey private lands habitat mitigation portfolio for the Desert Harvest solar project. Based on our current lands portfolio and knowledge of suitable private lands available, Wildlands is confident we can develop a Formal Mitigation Acquisition Proposal sufficient to meet the specific habitat mitigation permit conditions required by the natural resource agencies including but not limited to U.S. Fish and Wildlife Service, U.S. Bureau of Land Management and California Department of Fish and Game.

Wildlands is currently working to develop a private lands mitigation portfolio for the project in anticipation of a formal purchase and sale agreement between Wildlands and enXco. We look forward to finalizing an agreement and presenting enXco with a full delivery solution in a timeframe that meets the conditions of the various Desert Harvest project permits.

Thank you again for the opportunity to work with enXco.

Appendix C.13

Mojave Fringe-toed Lizard (*Uma scoparia*) Habitat Assessment

Mojave Fringe-toed Lizard *Uma scoparia* Habitat Assessment

enXco Desert Harvest Solar Energy Project

Prepared for:
Aspen Environmental Group
201 North First Ave., Suite 102, Upland CA 91786

Prepared by:
Robert Black
11081 Cholla Ave., Morongo Valley CA 92256

INTRODUCTION

This report addresses the results of the Mojave fringed-toed lizard (MFTL) habitat assessment on the proposed Desert Harvest solar project site near Desert Center California. Habitat within the project site boundaries and the solar footprint was observed to see what if any was suitable for the Mojave Fringe-toed Lizard.

Mojave fringe-toed lizard (*Uma scoparia*)

Mojave fringe-toed lizards occur in the lower Sonoran life zones of the Mojave Desert and the northwestern reaches of the Sonoran desert (Hollingsworth and Beaman et al. 1999). The Mojave fringe-toed lizard is found in arid, sandy, sparsely vegetated habitats, within the broader matrix of creosote bush scrub, throughout much of its range (Norris 1958). The most important factor in its habitat is the presence of fine sands, but it also uses surrounding desert habitat. It is restricted to habitats where fine loose, aeolian (windblown) sand, typically with grain size no coarser than 0.375 mm in diameter and at least a few inches deep, is available (Stebbins 1944; Turner et al. 1984). They also may be found in surrounding habitat as far as at least 45 M from aeolian sand deposits (Norris 1958).

Methodology

As an experienced MFTL surveyor I conducted the habitat assessment with assistance from S. White and D. Ray by walking and driving to precise coordinates to analyze and photograph the habitat of the project sites on 2/25/2011, 3/05/2011 and 3/12/2011. Starting at the larger northern project site coordinates were plotted north, south, east and west boundaries. Alluvial fan desert scrub habitat was observed while walking. Several washes that produced loose sand were checked for sand grain size consistency, sand depth and MFTL tracks and other sign.

Summary of Conclusions

The Desert Harvest project site does not appear to provide suitable habitat for Mojave fringe-toed lizard. Ephemeral washes and channels throughout the site provide alluvial sand habitats but were often cemented or compacted, and the sand depth and coarse texture was not conducive for MFTL occupancy. The few isolated areas where deeper, loose sand was present were not large enough to support MFTL occupancy. No MFTL or their sign was observed throughout the field survey, though temperatures and times were suitable for their activity.

Northern Project Site

The Northern project site is primarily characterized by alluvial fan desert scrub with some Ironwood trees along its southern boundary. Several moderate to light alluvial channels pass through it. The exposed base substrate is largely a mix of cemented sand or gravel and where loose sand was present within the washes, sand depth and consistency was not conducive for MFTL occupancy.

3348095 N, 11524184 W, Point (1) The northwestern boundary west of Kaiser Road. This region has light alluvial braiding within its desert scrub makeup however none of these braids had any fine sand depth or consistency for MFTL occupancy.



Facing N



Facing E

3348095 N, 11524058 W, Point (2) The northern boundary east of Kaiser Road. This region is alluvial fan desert scrub with a mix of moderate and light alluvial braiding. The moderate braids running northwest to southeast closer to Kaiser Road had some finer aeolian sand deposits but most of these were cemented and lacked the necessary depth conducive for MFTL occupancy.



Facing N



Facing S

3348095N, 11523377 W, Point (3) This region is alluvial fan desert scrub with several shallow and narrow alluvial braids. Habitat between these shallow braids is coarse gravel and where fine aeolian sand deposits exist they lack enough depth for MFTL occupancy.



Facing N



Facing S

3348095 N, 11523058 W, Point (4) This region is alluvial fan desert scrub with several faint alluvial braids. Much of this region is peppered with a thin layer of aeolian sand and just below it is an exposed base substrate of gravel. This region is not conducive for MFTL occupancy.



Facing N



Facing S

3348094 N, 11522343 W, Point (5) This regions is alluvial fan desert scrub with a few wider washes, however, they lack any depth and the majority of the sand is too compacted for MFTL occupancy.



Facing N



Facing S

3348094 N, 11522031 W, Point (6) This region is alluvial fan desert scrub with much of the region having an exposed base substrate of gravel and cemented sands. Very few alluvial braids were present. This region is not conducive for MFTL occupancy.



Facing N



Facing S

3348093 N, 11521308 W, Point (7) The northeastern boundary. This region is alluvial fan desert scrub with very faint alluvial braiding. This region is largely made up of an exposed base substrate of gravel and cemented sands. This region is not conducive for MFTL occupancy.



Facing N



Facing S

3347878 N, 11521312 W, Point (8) The eastern boundary. This region is alluvial fan desert scrub with very light alluvial braiding. A few very narrow and shallow washes were examined for sand depth and consistency. None were found to be conducive for MFTL occupancy.



Facing N



Facing S

3347871 N, 11521566 W, Point (9) This region is alluvial fan desert scrub with very light braiding. Only a few narrow and shallow washes in this region, which have compacted sands and are not conducive for MFTL occupancy.



Facing N



Facing S

3347442 N, 11521570 W, Point (10) This region is alluvial fan desert scrub with very faint surface braiding. Fine sand deposits were extremely shallow. This region is not conducive for MFTL occupancy.



Facing N



Facing S

3347442 N, 11521318 W, Point (11) This region is alluvial fan desert scrub with an exposed base rock substrate. Very light alluvial braiding is visible within this region and cannot support MFTL occupancy.



Facing N



Facing S

3347227 N, 11521318 W, Point (12) Southeast boundary. This region is alluvial fan desert scrub. A few narrow washes in the upper part of this region were examined for sand depth and consistency. None had suitable depth for MFTL occupancy. The southern end of this region crosses a dirt road and runs into an area of agriculture.



Facing N



Facing W

3347228 N, 11522234 W, Point (13) Heading west along the southern boundary this region is alluvial fan desert scrub with many Ironwood trees mixed throughout the alluvial braids and washes. There are isolated areas of fine sand but overall depth and consistency within these braided networks is not conducive for MFTL occupancy.



Facing N



Facing S

3347336 N, 11522497 W, Point (14) Southern boundary. This region is alluvial fan desert scrub with a mix of Ironwood trees throughout. Several sand hummocks appear within this region, but upon examination the sand is too cemented and compacted for MFTL occupancy.



Facing N



Facing S

3347443 N, 115 11522624 W, Point (15) Southern Boundary. This region is alluvial fan desert scrub mixed with Ironwood trees throughout. Several shallow washes were checked for sand grain size and consistency. The sand was too cemented and compacted for MFTL occupancy.



Facing N



Facing S

3347553 N, 11522753 W, Point (16) Heading west along the southern boundary this region is alluvial fan desert scrub mixed with Ironwood trees throughout several braided washes. Isolated pockets of aeolian sand were located but overall depth and consistency are not conducive for MFTL occupancy.



Facing N



Facing S

3347663 N, 11523409 W, Point (17) This region is alluvial fan desert scrub with a few scattered Ironwood trees. The few shallow washes in this region are not conducive for MFTL occupancy.



Facing N



Facing S

3347770 N, 11523670 W, Point (18) This region is alluvial fan desert scrub with a few Ironwood trees. This area has minimal narrow and shallow washes separated by an exposed base substrate of coarse gravel. This region is not conducive for MFTL occupancy.



Facing N



Facing S

3347877 N, 11523928 W, Point (19) This region is alluvial fan desert scrub with a few Ironwood trees present. The majority of this area has an exposed base substrate of coarse gravel and cemented sands. The few shallow and narrow washes here are not conducive for MFTL occupancy.



Facing N



Facing S

3347986 N, 11524184 W, Point (20) This region is alluvial fan desert scrub with a few Ironwood trees with an exposed base substrate of coarse gravel. The few small washes in this region were checked for sand depth and consistency. None were conducive to for MFTL occupancy.



Facing N



Facing S

Results

The habitat observed within the proposed Northern project site and its footprint is characterized as alluvial fan desert scrub with Ironwood trees present near its southern boundary. Moderate to light alluvial braiding was documented however the sand within these braids and washes observed was either too cemented and compacted or not fine enough. Sand depth where present throughout these braided networks is very shallow. There were a few isolated areas within these braids that had finer loose sand however not enough to support MFTL occupancy. No MFTL or their sign was observed while temperatures and times were conducive to their activity.

Southern Project Site

The Southern project site is primarily characterized by alluvial fan desert scrub with a mix of Ironwood trees throughout. Several moderate to faint alluvial channels pass through it. The exposed base substrate is largely a mix of cemented sand or gravel and where loose sand was present within the washes, sand depth and consistency was not conducive for MFTL occupancy.

3347659 N, 11525450 W, Point (21) Northwest boundary. This region is alluvial fan desert scrub with an exposed base substrate of coarse gravel and rock. Very minimal alluvial braiding that is not conducive for MFTL occupancy.



Facing N



Facing S

3347660 N, 11524188 W, Point (22) Northern boundary. This region is alluvial fan desert scrub with very light alluvial braids. The with coarse rock and gravel exposed. This area is not conducive for MFTL occupancy.



Facing N



Facing S

3347552 N, 11524185 W, Point (23) Northern boundary. This region is alluvial fan desert scrub with minimal Ironwood trees present. A few shallow washes were checked for sand depth and consistency. None were found conducive for MFTL occupancy.



Facing N



Facing S

3347553 N, 11523670 W, Point (24) Northern boundary. This region is alluvial fan desert scrub with a few Ironwood trees mixed throughout. This area showed light alluvial braiding however none of these braids were conducive for MFTL occupancy.



Facing N



Facing S

3347442 N, 11523417 W, Point (25) This region is alluvial fan desert scrub with Ironwood trees present. Several small washes were present with small pockets of finer sand however none of these had enough sand depth for MFTL occupancy.



Facing N



Facing S

3347337 N, 11523018 W, Point (26) This region is alluvial fan desert scrub with Ironwood trees present. This area appeared to have more fine sand but on close examination the sand was too compacted and cemented to be conducive for MFTL occupancy.



Facing N



Facing S

3347227 N, 11523018 W, Point (27) This region is alluvial fan desert scrub with Ironwood trees present. This area had light alluvial braiding that was dominated by an exposed base substrate of coarse gravel that is not conducive for MFTL occupancy.



Facing N



Facing S

3347227 N, 11523540 W, Point (28) This region is alluvial fan desert scrub with Ironwood trees present. This area had a few shallow and narrow washes that were not conducive for MFTL occupancy.



Facing N



Facing S

3347224 N, 11524455 W, Point (29) This region is alluvial fan desert scrub with a few Ironwood trees present. This area has an exposed base substrate of coarse gravel and rock. Alluvial braiding is extremely faint and not conducive for MFTL occupancy.



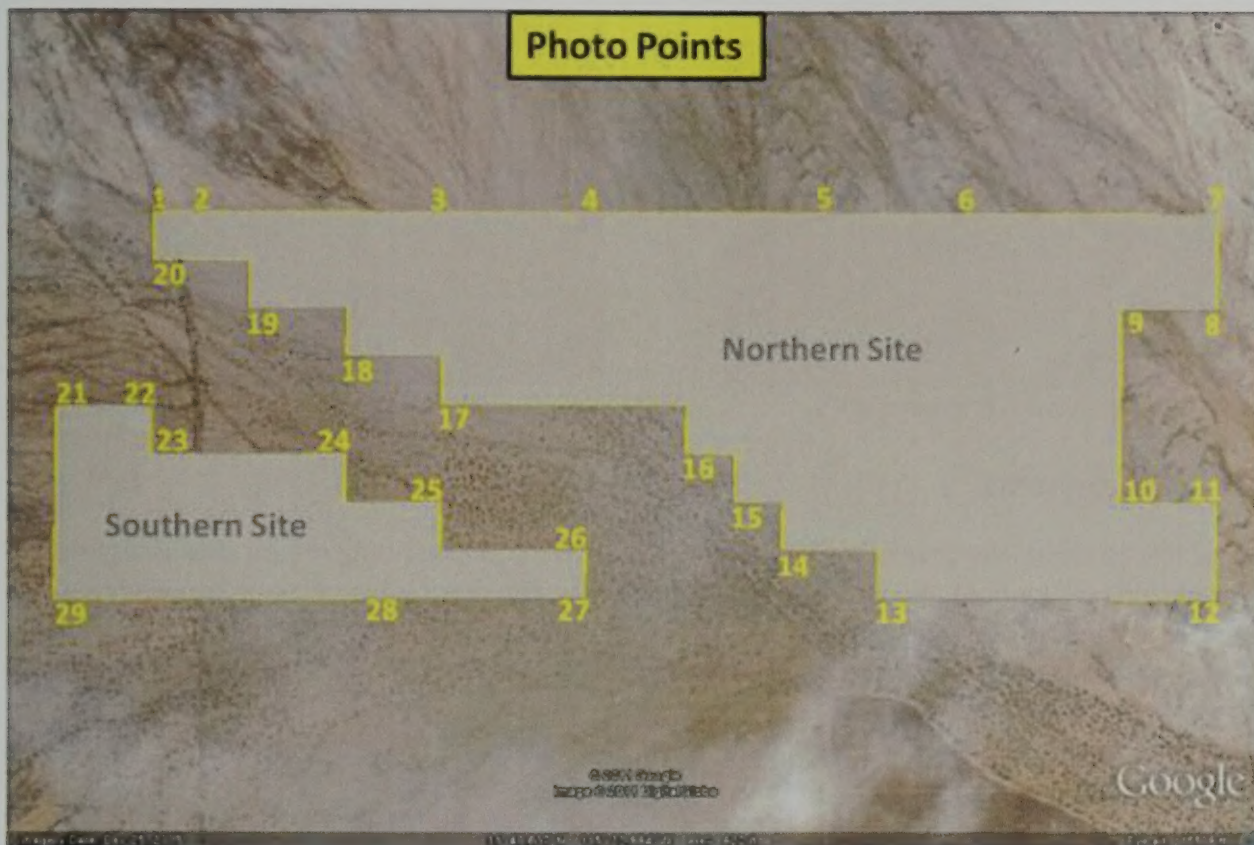
Facing N



Facing S

Results

The habitat observed within the southern project site and its footprint is characterized as alluvial fan desert scrub with Ironwood trees present throughout much of its ephemeral makeup. Moderate to light alluvial braiding was documented however the sand within these braids and washes was either too compacted or not fine enough. Sand depth where present throughout these braided networks is very shallow. There were a few isolated areas within these braids that had some finer loose sand however not enough to support MFTL occupancy. No MFTL or their sign was observed while temperatures and times were conducive to their activity.



Lizard species observed at both project sites

Scientific name

Callisaurus draconoids

Cnemidophorus tigris

Disosaurus dorsalis

Uta stansburiana

Common name

Zebra-tail lizard

Western whiptail

Desert Iguana

Side-blotched lizard



Zebra-tail lizard Southern Site



Western whiptail Southern Site



Desert Iguana Northern Site



Side-blotched lizard Northern Site

Acknowledgements

I would like to especially thank Dr. Cameron Barrows for recommending me for this assessment and reviewing it. I would also like to thank Dr. Barrows for sharing his years of knowledge and expertise and hard work within the genus *Uma*. I would also like to thank the following professionals for their support and assistance in this assessment. Scott White and Dustin Ray.

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Appendix D

Air Quality / Greenhouse Gas Calculations

Desert Harvest
Riverside-Mojave Desert SCAQMD County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
General Light Industry	52620.5	1000sqft
Industrial Park	130.7	1000sqft

1.2 Other Project Characteristics

Urbanization Rural

Wind Speed (m/s) 2.6

Utility Company Southern California Edison

Climate Zone 10

Precipitation Freq (Days) 28

1.3 User Entered Comments

Project Characteristics - -

Land Use - 1208 acres for entire construction, 3 acres for O&M Facility

Construction Phase - Entire Construction Period, Phase 1 and Phase 2

Off-road Equipment - Average daily usage calculated based on equipment provided by the applicant

Off-road Equipment - Pump - Hydraulic Ram, Bore/Drill Rig - Pile Driver, Others - ATV, Power Screener, Cable Plow

Trips and VMT - Average employee trips - 100, Truck Deliveries - 56, Vendor Trips - 3 water trucks*8 hours and 30 pickup trucks*12 hours, 15 mph each

On-road Fugitive Dust - estimation

Grading - 35,000 tons of equipment and materials, 1208 acres for two-year constructions

Vehicle Trips - 16 employee commuting trips, 4 onsite pickup trucks, 3 water truck trips

Vehicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Vehicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Vehicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Road Dust - 160 mile / 7660 mile

Consumer Products - lowest EF possible

Area Coating - $250 \times (3/1211)$

Landscape Equipment - -

Energy Use - no operation for 1208 acres

Water And Wastewater - no operation for 1208 acres

Solid Waste - no operation for 1208 acres

Construction Off-road Equipment Mitigation - -

Mobile Land Use Mitigation - -

Area Mitigation - -

Energy Mitigation - -

Water Mitigation - -

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2012	5.95	31.42	28.20	0.05	27.02	1.77	28.79	2.85	1.77	4.62	0.00	4,177.16	4,177.16	0.46	0.00	4,186.84
2013	16.99	112.40	90.58	0.16	79.45	6.10	85.56	7.68	6.10	13.78	0.00	14,254.80	14,254.80	1.34	0.00	14,282.87
2014	10.32	68.82	57.33	0.11	52.67	3.66	56.32	5.09	3.66	8.75	0.00	9,418.10	9,418.10	0.82	0.00	9,435.31
Total	33.26	212.64	176.11	0.32	159.14	11.53	170.67	15.62	11.53	27.15	0.00	27,850.06	27,850.06	2.62	0.00	27,905.02

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2012	4.62	15.27	27.66	0.05	9.63	1.11	10.74	0.97	1.11	2.08	0.00	4,177.16	4,177.16	0.46	0.00	4,186.84
2013	11.84	45.80	95.93	0.16	28.23	3.61	31.84	2.57	3.61	6.18	0.00	14,254.80	14,254.80	1.34	0.00	14,282.87
2014	7.52	29.21	61.39	0.11	18.71	2.36	21.07	1.70	2.36	4.06	0.00	9,418.10	9,418.10	0.82	0.00	9,435.31
Total	23.98	90.28	184.98	0.32	56.57	7.08	63.65	5.24	7.08	12.32	0.00	27,850.06	27,850.06	2.62	0.00	27,905.02

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	406.40	406.40	0.02	0.01	408.95
Mobile	0.42	0.46	4.55	0.01	8.94	0.03	8.97	0.85	0.03	0.88	0.00	549.34	549.34	0.04	0.00	550.12
Waste						0.00	0.00		0.00	0.00	326.54	0.00	326.54	19.30	0.00	731.79
Water						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.53	0.46	4.55	0.01	8.94	0.03	8.97	0.85	0.03	0.88	326.54	955.74	1,282.28	19.36	0.01	1,690.86

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.42	0.46	4.55	0.01	8.94	0.03	8.97	0.85	0.03	0.88	0.00	549.34	549.34	0.04	0.00	550.12
Waste						0.00	0.00		0.00	0.00	326.54	0.00	326.54	19.30	0.00	731.79
Water						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.53	0.46	4.55	0.01	8.94	0.03	8.97	0.85	0.03	0.88	326.54	549.34	875.88	19.34	0.00	1,281.91

3.0 Construction Detail

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Use Oxidation Catalyst for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

3.2 Material - 2012

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.84	0.00	0.84	0.32	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	4.54	25.46	16.36	0.03		1.55	1.55		1.55	1.55	0.00	2,586.58	2,586.58	0.37	0.00	2,594.35
Total	4.54	25.46	16.36	0.03	0.84	1.55	2.39	0.32	1.55	1.87	0.00	2,586.58	2,586.58	0.37	0.00	2,594.35

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.01	0.10	0.03	0.00	15.10	0.00	15.10	1.47	0.00	1.47	0.00	15.42	15.42	0.00	0.00	15.43
Vendor	0.55	5.02	2.71	0.01	10.37	0.17	10.54	1.03	0.17	1.20	0.00	827.77	827.77	0.02	0.00	828.14
Worker	0.85	0.84	9.09	0.01	0.71	0.05	0.76	0.03	0.05	0.08	0.00	747.39	747.39	0.07	0.00	748.93
Total	1.41	5.96	11.83	0.02	26.18	0.22	26.40	2.53	0.22	2.75	0.00	1,590.58	1,590.58	0.09	0.00	1,592.50

3.2 Material - 2012

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.33	0.00	0.33	0.12	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	3.21	9.32	15.82	0.03		0.89	0.89		0.89	0.89	0.00	2,586.58	2,586.58	0.37	0.00	2,594.35
Total	3.21	9.32	15.82	0.03	0.33	0.89	1.22	0.12	0.89	1.01	0.00	2,586.58	2,586.58	0.37	0.00	2,594.35

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.01	0.10	0.03	0.00	5.08	0.00	5.09	0.47	0.00	0.47	0.00	15.42	15.42	0.00	0.00	15.43
Vendor	0.55	5.02	2.71	0.01	3.51	0.17	3.68	0.35	0.17	0.52	0.00	827.77	827.77	0.02	0.00	828.14
Worker	0.85	0.84	9.09	0.01	0.71	0.05	0.76	0.03	0.05	0.08	0.00	747.39	747.39	0.07	0.00	748.93
Total	1.41	5.96	11.83	0.02	9.30	0.22	9.53	0.85	0.22	1.07	0.00	1,590.58	1,590.58	0.09	0.00	1,592.50

3.3 Building Construction - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	13.32	96.53	58.59	0.11		5.50	5.50		5.50	5.50	0.00	9,513.40	9,513.40	1.08	0.00	9,536.14
Total	13.32	96.53	58.59	0.11		5.50	5.50		5.50	5.50	0.00	9,513.40	9,513.40	1.08	0.00	9,536.14

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.05	0.02	0.00	45.81	0.00	45.81	4.46	0.00	4.46	0.00	9.27	9.27	0.00	0.00	9.27
Vendor	1.32	13.48	6.77	0.03	31.49	0.45	31.94	3.13	0.45	3.58	0.00	2,509.90	2,509.90	0.05	0.00	2,510.89
Worker	2.35	2.34	25.21	0.03	2.16	0.15	2.30	0.09	0.15	0.24	0.00	2,222.24	2,222.24	0.21	0.00	2,226.58
Total	3.67	15.87	32.00	0.06	79.46	0.60	80.05	7.68	0.60	8.28	0.00	4,741.41	4,741.41	0.26	0.00	4,746.74

3.3 Building Construction - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.17	29.93	63.93	0.11		3.01	3.01		3.01	3.01	0.00	9,513.40	9,513.40	1.08	0.00	9,536.14
Total	8.17	29.93	63.93	0.11		3.01	3.01		3.01	3.01	0.00	9,513.40	9,513.40	1.08	0.00	9,536.14

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.05	0.02	0.00	15.42	0.00	15.43	1.43	0.00	1.43	0.00	9.27	9.27	0.00	0.00	9.27
Vendor	1.32	13.48	6.77	0.03	10.65	0.45	11.10	1.05	0.45	1.50	0.00	2,509.90	2,509.90	0.05	0.00	2,510.89
Worker	2.35	2.34	25.21	0.03	2.16	0.15	2.30	0.09	0.15	0.24	0.00	2,222.24	2,222.24	0.21	0.00	2,226.58
Total	3.67	15.87	32.00	0.06	28.23	0.60	28.83	2.57	0.60	3.17	0.00	4,741.41	4,741.41	0.26	0.00	4,746.74

3.3 Building Construction - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.22	59.46	38.32	0.07		3.30	3.30		3.30	3.30	0.00	6,305.81	6,305.81	0.66	0.00	6,319.77
Total	8.22	59.46	38.32	0.07		3.30	3.30		3.30	3.30	0.00	6,305.81	6,305.81	0.66	0.00	6,319.77

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.03	0.01	0.00	30.37	0.00	30.37	2.96	0.00	2.96	0.00	6.14	6.14	0.00	0.00	6.14
Vendor	0.67	7.90	3.69	0.02	20.87	0.26	21.13	2.08	0.26	2.34	0.00	1,662.15	1,662.15	0.03	0.00	1,662.71
Worker	1.43	1.43	15.31	0.02	1.43	0.10	1.53	0.06	0.10	0.16	0.00	1,444.00	1,444.00	0.13	0.00	1,446.69
Total	2.10	9.36	19.01	0.04	52.67	0.36	53.03	5.10	0.36	5.46	0.00	3,112.29	3,112.29	0.16	0.00	3,115.54

3.3 Building Construction - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.42	19.84	42.38	0.07		2.00	2.00		2.00	2.00	0.00	6,305.81	6,305.81	0.66	0.00	6,319.77
Total	5.42	19.84	42.38	0.07		2.00	2.00		2.00	2.00	0.00	6,305.81	6,305.81	0.66	0.00	6,319.77

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.03	0.01	0.00	10.22	0.00	10.22	0.95	0.00	0.95	0.00	6.14	6.14	0.00	0.00	6.14
Vendor	0.67	7.90	3.69	0.02	7.06	0.26	7.32	0.70	0.26	0.96	0.00	1,662.15	1,662.15	0.03	0.00	1,662.71
Worker	1.43	1.43	15.31	0.02	1.43	0.10	1.53	0.06	0.10	0.16	0.00	1,444.00	1,444.00	0.13	0.00	1,446.69
Total	2.10	9.36	19.01	0.04	18.71	0.36	19.07	1.71	0.36	2.07	0.00	3,112.29	3,112.29	0.16	0.00	3,115.54

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.42	0.46	4.55	0.01	8.94	0.03	8.97	0.85	0.03	0.88	0.00	549.34	549.34	0.04	0.00	550.12
Unmitigated	0.42	0.46	4.55	0.01	8.94	0.03	8.97	0.85	0.03	0.88	0.00	549.34	549.34	0.04	0.00	550.12
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Industrial Park	78.42	78.42	78.42	1,070,433	1,070,433
Total	78.42	78.42	78.42	1,070,433	1,070,433

4.3 Trip Type Information

Land Use	Miles			Trip %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
General Light Industry	0.00	0.00	0.00	100.00	0.00	0.00
Industrial Park	0.00	0.00	0.00	100.00	0.00	0.00

5.0 Energy Detail

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Percent of Electricity Use Generated with Renewable Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity Unmitigated						0.00	0.00		0.00	0.00	0.00	406.40	406.40	0.02	0.01	408.95
NaturalGas Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NaturalGas Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
General Light Industry	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Park	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
General Light Industry	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Park	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
General Light Industry	0					0.00	0.00	0.00	0.00
Industrial Park	1.39718e+006					406.40	0.02	0.01	408.95
Total						406.40	0.02	0.01	408.95

Mitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
General Light Industry	0					0.00	0.00	0.00	0.00
Industrial Park	0					0.00	0.00	0.00	0.00
Total						0.00	0.00	0.00	0.00

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unmitigated	1.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.15					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.96					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.15					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.96					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Use Reclaimed Water

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr				MT/yr			
Mitigated					0.00	0.00	0.00	0.00
Unmitigated					0.00	0.00	0.00	0.00
Total	NA	NA	NA	NA	NA	NA	NA	NA

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
General Light Industry	0 / 0					0.00	0.00	0.00	0.00
Industrial Park	0 / 0					0.00	0.00	0.00	0.00
Total						0.00	0.00	0.00	0.00

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
General Light Industry	0 / 0					0.00	0.00	0.00	0.00
Industrial Park	0 / 0					0.00	0.00	0.00	0.00
Total						0.00	0.00	0.00	0.00

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
	tons/yr				MT/yr			
Mitigated					326.54	19.30	0.00	731.79
Unmitigated					326.54	19.30	0.00	731.79
Total	NA	NA	NA	NA	NA	NA	NA	NA

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
General Light Industry	0					0.00	0.00	0.00	0.00
Industrial Park	1608.62					326.54	19.30	0.00	731.79
Total						326.54	19.30	0.00	731.79

Mitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
General Light Industry	0					0.00	0.00	0.00	0.00
Industrial Park	1608.62					326.54	19.30	0.00	731.79
Total						326.54	19.30	0.00	731.79

9.0 Vegetation

Desert Harvest
Riverside-Mojave Desert SCAQMD County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
General Light Industry	52620.5	1000sqft
Industrial Park	130.7	1000sqft

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Utility Company	Southern California Edison
Climate Zone	10	Precipitation Freq (Days)	28		

1.3 User Entered Comments

Project Characteristics - -

Land Use - 1208 acres for entire construction, 3 acres for O&M Facility

Construction Phase - Entire Construction Period, Phase 1 and Phase 2

Off-road Equipment - Average daily usage calculated based on equipment provided by the applicant

Off-road Equipment - Pump - Hydraulic Ram, Bore/Drill Rig - Pile Driver, Others - ATV, Power Screener, Cable Plow

Trips and VMT - Average employee trips - 100, Truck Deliveries - 56, Vendor Trips - 3 water trucks*8 hours and 30 pickup trucks*12 hours, 15 mph each

On-road Fugitive Dust - estimation

Grading - 35,000 tons of equipment and materials, 1208 acres for two-year constructions

Vehicle Trips - 16 employee commuting trips, 4 onsite pickup trucks, 3 water truck trips

Vehicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Vehicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Vehicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Road Dust - 160 mile / 7660 mile

Consumer Products - lowest EF possible

Area Coating - $250 \times (3/1211)$

Landscape Equipment - -

Energy Use - no operation for 1208 acres

Water And Wastewater - no operation for 1208 acres

Solid Waste - no operation for 1208 acres

Construction Off-road Equipment Mitigation - -

Mobile Land Use Mitigation - -

Area Mitigation - -

Energy Mitigation - -

Water Mitigation - -

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2012	142.19	734.73	710.65	1.06	679.43	41.16	720.60	70.26	41.16	111.43	0.00	107,555.65	0.00	12.00	0.00	107,807.63
2013	133.72	865.08	742.11	1.23	659.89	46.76	706.65	63.62	46.76	110.39	0.00	120,878.86	0.00	11.46	0.00	121,119.47
2014	122.54	799.15	704.92	1.23	659.89	42.30	702.18	63.62	42.30	105.92	0.00	120,484.06	0.00	10.61	0.00	120,706.81
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2012	111.29	359.15	698.13	1.06	242.37	25.84	268.21	23.80	25.84	49.64	0.00	107,555.65	0.00	12.00	0.00	107,807.63
2013	94.27	354.63	783.09	1.23	234.74	27.67	262.41	21.20	27.67	48.88	0.00	120,878.86	0.00	11.46	0.00	121,119.47
2014	90.16	341.02	751.84	1.23	234.74	27.26	262.00	21.20	27.26	48.46	0.00	120,484.06	0.00	10.61	0.00	120,706.81
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	6.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Mobile	2.89	3.50	30.68	0.04	49.44	0.18	49.62	4.70	0.18	4.88		3,461.62		0.24		3,466.61
Total	9.00	3.50	30.68	0.04	49.44	0.18	49.62	4.70	0.18	4.88		3,461.62		0.24	0.00	3,466.61

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	6.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Mobile	2.89	3.50	30.68	0.04	49.44	0.18	49.62	4.70	0.18	4.88		3,461.62		0.24		3,466.61
Total	9.00	3.50	30.68	0.04	49.44	0.18	49.62	4.70	0.18	4.88		3,461.62		0.24	0.00	3,466.61

3.0 Construction Detail

3.1 Mitigation Measures Construction

- Use Cleaner Engines for Construction Equipment
- Use DPF for Construction Equipment
- Use Oxidation Catalyst for Construction Equipment
- Use Soil Stabilizer
- Water Exposed Area

3.2 Material - 2012

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.54	0.00	19.54	6.63	0.00	6.63						0.00
Off-Road	105.52	592.31	380.48	0.66		36.03	36.03		36.03	36.03		66,325.41		9.48		66,524.56
Total	105.52	592.31	380.48	0.66	19.54	36.03	55.57	6.63	36.03	42.66		66,325.41		9.48		66,524.56

3.2 Material - 2012

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.17	2.46	0.75	0.00	380.38	0.09	380.47	37.02	0.09	37.11		395.44		0.01		395.62
Vendor	12.90	118.31	67.44	0.20	261.39	3.90	265.29	25.94	3.90	29.84		21,270.14		0.45		21,279.60
Worker	23.59	21.65	261.99	0.20	18.13	1.14	19.27	0.68	1.14	1.82		19,564.65		2.06		19,607.86
Total	36.66	142.42	330.18	0.40	659.90	5.13	665.03	63.64	5.13	68.77		41,230.23		2.52		41,283.08

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.62	0.00	7.62	2.58	0.00	2.58						0.00
Off-Road	74.62	216.73	367.96	0.66		20.71	20.71		20.71	20.71	0.00	66,325.41		9.48		66,524.56
Total	74.62	216.73	367.96	0.66	7.62	20.71	28.33	2.58	20.71	23.29	0.00	66,325.41		9.48		66,524.56

3.2 Material - 2012

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.17	2.46	0.75	0.00	128.18	0.09	128.27	11.86	0.09	11.95		395.44		0.01		395.62
Vendor	12.90	118.31	67.44	0.20	88.44	3.90	92.35	8.68	3.90	12.58		21,270.14		0.45		21,279.60
Worker	23.59	21.65	261.99	0.20	18.13	1.14	19.27	0.68	1.14	1.82		19,564.65		2.06		19,607.86
Total	36.66	142.42	330.18	0.40	234.75	5.13	239.89	21.22	5.13	26.35		41,230.23		2.52		41,283.08

3.3 Building Construction - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	102.08	739.89	449.05	0.82		42.17	42.17		42.17	42.17		80,379.94		9.15		80,572.07
Total	102.08	739.89	449.05	0.82		42.17	42.17		42.17	42.17		80,379.94		9.15		80,572.07

3.3 Building Construction - 2013

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.43	0.14	0.00	380.37	0.02	380.39	37.01	0.02	37.03		78.32		0.00		78.35
Vendor	10.07	104.82	53.99	0.20	261.39	3.44	264.83	25.94	3.44	29.38		21,250.54		0.39		21,258.71
Worker	21.53	19.94	238.93	0.20	18.13	1.14	19.27	0.68	1.14	1.82		19,170.07		1.92		19,210.34
Total	31.63	125.19	293.06	0.40	659.89	4.60	664.49	63.63	4.60	68.23		40,498.93		2.31		40,547.40

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	62.64	229.45	490.03	0.82		23.08	23.08		23.08	23.08	0.00	80,379.94		9.15		80,572.07
Total	62.64	229.45	490.03	0.82		23.08	23.08		23.08	23.08	0.00	80,379.94		9.15		80,572.07

3.3 Building Construction - 2013

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.43	0.14	0.00	128.17	0.02	128.18	11.85	0.02	11.86		78.32		0.00		78.35
Vendor	10.07	104.82	53.99	0.20	88.44	3.44	91.89	8.68	3.44	12.12		21,250.54		0.39		21,258.71
Worker	21.53	19.94	238.93	0.20	18.13	1.14	19.27	0.68	1.14	1.82		19,170.07		1.92		19,210.34
Total	31.63	125.19	293.06	0.40	234.74	4.60	239.34	21.21	4.60	25.80		40,498.93		2.31		40,547.40

3.3 Building Construction - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	95.01	687.57	443.11	0.82		38.12	38.12		38.12	38.12		80,379.84		8.48		80,557.84
Total	95.01	687.57	443.11	0.82		38.12	38.12		38.12	38.12		80,379.84		8.48		80,557.84

3.3 Building Construction - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.37	0.12	0.00	380.37	0.01	380.39	37.01	0.01	37.02		78.28		0.00		78.31
Vendor	7.76	92.79	43.02	0.20	261.39	3.03	264.41	25.94	3.03	28.97		21,231.01		0.33		21,238.04
Worker	19.74	18.42	218.67	0.20	18.13	1.14	19.27	0.68	1.14	1.82		18,794.93		1.79		18,832.62
Total	27.53	111.58	261.81	0.40	659.89	4.18	664.07	63.63	4.18	67.81		40,104.22		2.12		40,148.97

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	62.64	229.45	490.03	0.82		23.08	23.08		23.08	23.08	0.00	80,379.84		8.48		80,557.84
Total	62.64	229.45	490.03	0.82		23.08	23.08		23.08	23.08	0.00	80,379.84		8.48		80,557.84

3.3 Building Construction - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.37	0.12	0.00	128.17	0.01	128.18	11.85	0.01	11.86		78.28		0.00		78.31
Vendor	7.76	92.79	43.02	0.20	88.44	3.03	91.47	8.68	3.03	11.71		21,231.01		0.33		21,238.04
Worker	19.74	18.42	218.67	0.20	18.13	1.14	19.27	0.68	1.14	1.82		18,794.93		1.79		18,832.62
Total	27.53	111.58	261.81	0.40	234.74	4.18	238.92	21.21	4.18	25.39		40,104.22		2.12		40,148.97

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.89	3.50	30.68	0.04	49.44	0.18	49.62	4.70	0.18	4.88		3,461.62		0.24		3,466.61
Unmitigated	2.89	3.50	30.68	0.04	49.44	0.18	49.62	4.70	0.18	4.88		3,461.62		0.24		3,466.61
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Industrial Park	78.42	78.42	78.42	1,070,433	1,070,433
Total	78.42	78.42	78.42	1,070,433	1,070,433

4.3 Trip Type Information

Land Use	Miles			Trip %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
General Light Industry	0.00	0.00	0.00	100.00	0.00	0.00
Industrial Park	0.00	0.00	0.00	100.00	0.00	0.00

5.0 Energy Detail

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Percent of Electricity Use Generated with Renewable Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
NaturalGas Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
General Light Industry	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Industrial Park	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
General Light Industry	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Industrial Park	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total		0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	6.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Unmitigated	6.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.83					0.00	0.00		0.00	0.00						0.00
Consumer Products	5.28					0.00	0.00		0.00	0.00						0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	6.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.83					0.00	0.00		0.00	0.00						0.00
Consumer Products	5.28					0.00	0.00		0.00	0.00						0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	6.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Use Reclaimed Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Vegetation

Appendix E

Water Supply Assessment

WATER SUPPLY ASSESSMENT

for

**Desert Harvest Solar Project
Riverside County, California**

in compliance with

California Water Code & Senate Bill 610

April 2012

Prepared by:

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1. INTRODUCTION

Senate Bill 610 (SB 610) was passed on January 1, 2002, amending California Water Code to require detailed analysis of water supply availability for certain types of development projects. The primary purpose of SB 610 is to improve the linkage between water and land use planning by ensuring greater communication between water providers and local planning agencies, and ensuring that land use decisions for certain large development projects are fully informed as to whether sufficient water supplies are available to meet project demands. SB 610 requires the preparation of a Water Supply Assessment (WSA) for a project that is subject to CEQA and meets certain requirements; each of which is discussed in detail in Section 4 of this WSA.

When a WSA is required per SB 610, it must examine the availability of an identified water supply under normal-year, single-dry-year, and multiple-dry-year conditions over a 20-year projection, accounting for the projected water demand of the proposed project in addition to other existing and planned future uses of the identified water supply, including agricultural and manufacturing uses.

SB 610 was not originally clear on whether renewable energy developments such as the proposed project are subject to SB 610 and require the preparation of a WSA. However, Senate Bill 267 (SB 267) was signed into law by California's Governor Brown on October 8, 2011, amending California's Water Law to revise the definition of "project" specified in SB 610. Under SB 267, wind and photovoltaic projects which consume less than 75 acre-feet per year (afy) of water are not considered to be a "project" under SB 610; subsequently, a WSA would not be required for this type of project. SB 267 does not state that renewable energy projects which use more than 75 afy are subject to SB 610 and must prepare a WSA; rather, it clarifies that those renewable projects which use less than 75 afy are not subject to such requirements.

Water requirements associated with the Desert Harvest Solar Project (DHSP, or "proposed project") are described in Tables WSA-1 (Construction Water Requirements) and WSA-2 (Operational Water Requirements); as noted in Table WSA-1, the proposed project would consume more than 75 afy of water during construction. Therefore, the proposed project is considered a "project" under SB 610, as clarified by SB 267. The proposed DHSP site overlies the Chuckwalla Valley Groundwater Basin (CVGB), which is proposed as a potential water supply for construction and operation of the project. Mitigation measures identified in Section 4.22 of the Environmental Impact Statement (EIS) for the proposed project require alternative water source(s) to be used where use of CVGB water would result in adverse environmental effects; however, in an effort to make conservative estimates regarding potential impacts of the proposed DHSP, this WSA assesses the CVGB as the project's primary water supply. Mitigation measures associated with the proposed project; as relevant to water supply reliability, are further discussed in Section 4.6 of this WSA (see "Supply Reliability Considerations").

This WSA has been prepared in compliance with California Water Code, as amended by SB 610 and SB 267. Water supply availability projections are provided in Section 4 (Water Supply Planning), under "Groundwater Supply Availability." There is no existing Urban Water Management Plan (UWMP) or Integrated Regional Water Management Plan (IRWMP) which accounts for the proposed DHSP site and underlying groundwater resources (see Section 4.4); therefore, the water availability projections provided in this WSA rely on other available data sources and a series of reasonable assumptions, which are listed in Section 4.6. The steps

followed to ensure compliance of this WSA with California Water Code are described in Attachment A (DWR Guidebook for Implementation of Senate Bill 610 and Senate Bill 221).

2. PROJECT DESCRIPTION

The proposed DHSP would be a 150-megawatt (MW) nominal capacity, alternating current (AC) solar photovoltaic (PV) energy-generating project. Primary components of the proposed project include a main generation area, operations and maintenance (O&M) facility, on-site substation, switchyard, and site security. The project would be located on lands administered by the U.S. Bureau of Land Management (BLM), Palm Springs-South Coast Field Office in Riverside County, approximately 5 miles north of Desert Center. The project would be located on 1,208 acres. Estimated construction water requirements for the proposed DHSP are provided below, in Table WSA-1.

Table WSA-1. Construction Water Requirements

Construction Component	Acre-Feet per Year	Total Acre-Feet
Dust Suppression	400–500	800–1,000
Concrete Batching	0.51	1.02
Total	400.51–500.51	801.02–1,001.02

1 - The project would require 165 concrete truck deliveries during construction. Assuming that each truck would carry approximately 10 cubic yards of concrete, total concrete for the project is approximately 1,650 cubic yards. Per the 1997 Uniform Building Code (UBC, 1997), the maximum water-to-concrete ratio should be no more than 0.5 (see Tables 19-A-2 and 19-A-4, "Maximum Water-Cementitious Materials Ratio, By Weight, Normal-Weight Aggregate Concrete" of (UBC, 1997)). Assuming the weight of concrete is 150 pounds per cubic foot and the weight of water is 62.4 pounds per cubic foot, the total water required for concrete is 22,275 cubic feet, or approximately 0.51 acre-foot.

As shown in Table WSA-1, construction of the project would require an estimated 400.51 to 500.51 afy of water over the 24-month construction period, for a total of 801.02 to 1,001.02 acre-feet. In order to be conservative for the purposes of this analysis, it is assumed that construction of the proposed project would require 500.51 afy of water.

During operation and maintenance of the project, a double-pass reverse osmosis (RO) system and demineralization evaporation pond would be used to treat groundwater by decreasing concentrations of total dissolved solids (TDS) to a level acceptable for application on the panels. The RO system would produce up to approximately 20 gallons per minute (gpm) of low-TDS water, as well as approximately 9 gpm of "reject water," or brine water that is too high in TDS content to be applied to the PV panels during washing activities. As such, approximately 45 percent of water produced by the RO system would be reject water. The reject water would be piped to an evaporation pond encompassing approximately one acre, where the liquid would evaporate, leaving salts and minerals that would be cleaned out and disposed of at an appropriate facility as needed. Estimated operational water requirements associated with the proposed DHSP are provided below, in Table WSA-2.

Table WSA-2. Operational Water Requirements

Project Component	Acre-Feet per Year
Panel Washing	18–27
Reverse Osmosis Reject Water	8–12
O&M Facilities and Fire-Fighting	0.02 ¹
Total	26.02–39.02

¹ - One permanent, above-ground 5,000-gallon water storage tank would be used for O&M tasks and facilities, including on-site fire-fighting; 5,000 gallons converts to approximately 0.02 acre-feet. It is anticipated that the storage tank would need to be re-filled on an annual basis.

As shown in Table WSA-2, operation and maintenance of the project would require an estimated 26.02 to 39.02 afy. In order to be conservative for the purposes of this analysis, it is assumed that operation and maintenance of the proposed project would require 39.02 afy of water.

As discussed in the introduction provided in Section 1, this WSA assesses water supply availability in the CVGB. Section 3 of this WSA provides a detailed discussion of CVGB characteristics and water balance, while Section 4 provides assessment of the CVGB supplies per matrices identified in SB 610, including analysis of water supply availability over 20 years (see Section 4.6). Conclusions of this WSA are provided in Section 5.

3. CHUCKWALLA VALLEY GROUNDWATER BASIN

The Chuckwalla Valley Groundwater Basin (CVGB) is located in eastern Riverside County, and encompasses an area of approximately 605,000 acres, or 904 square miles.

Climate in this area is characterized by high aridity and low precipitation. The region experiences a wide variation in temperature, with very hot summer months with an average maximum temperature of 108 degrees Fahrenheit (°F) in July and cold dry winters with an average minimum temperature of 66.7 °F in December (BLM, 2011a).

Table WSA-3. Precipitation Data for Blythe Airport, California (1913–2008)

Month	Rainfall (inches) 1913–2008		
	Mean	Highest Month	Lowest Month
January	0.47	2.48	0
February	0.44	3.03	0
March	0.36	2.15	0
April	0.16	3.00	0
May	0.02	0.22	0
June	0.02	0.91	0
July	0.24	2.44	0
August	0.64	5.92	0
September	0.37	2.14	0
October	0.27	1.89	0
November	0.2	1.84	0
December	0.39	3.33	0
Total	3.59	n/a ¹	—

1 - Annual totals for the lowest and highest rainfall months are not available because these extreme months were not recorded in the same year.

Source: BLM 2011a

Average annual precipitation measures at Blythe Airport, west of the proposed DHSP site, is approximately 3.6 inches, with most rainfall occurring during the winter months or in association with summer tropical storms (BLM, 2011a). Recharge to the CVGB from precipitation is discussed below, under “Safe Yield / Budget” (see “Recharge from Precipitation”).

3.1 Basin Characteristics

The CVGB is located within the jurisdiction of the Colorado River Basin Regional Water Quality Control Board (RWQCB), and is subject to management direction of the Water Quality Control Plan (Basin Plan) for the Colorado River Basin (Region 7). For planning and reporting purposes, the Basin Plan divides Region 7 into seven major planning areas, on the basis of different economic and hydrologic characteristics (Colorado River Basin RWQCB, 2006); the CVGB is located within the Hayfield Planning Area.

The CVGB is bounded by consolidated rocks of the Chuckwalla, Little Chuckwalla, and Mule Mountains on the south, of the Eagle Mountains on the west, and of the Mule and McCoy Mountains on the east. Rocks of the Coxcomb, Granite, Palen, and Little Maria Mountains bound the valley on the north. The presence of seismic faults is considered likely in some parts of the CVGB, but no barriers to groundwater flow have been identified. (DWR, 2004a)

Water-bearing Features

Water-bearing features in this groundwater basin include Pliocene to Quaternary age continental deposits divided into Quaternary alluvium, the Pinto Formation, and the Bouse Formation. The maximum thickness of these deposits is about 1,200 feet and the average specific yield of the upper 500 feet of unconsolidated sediments is estimated (in 1979) to be 10 percent (DWR, 2004a). “Specific yield” is the ratio of the volume of water in a rock or soil will yield by gravity drainage to the total volume of the rock or soil (DWR, 2011). Specific yield is an important factor in water availability, and is the factor that is used to convert saturated thickness (water table elevation) to the actual volume of water available; although the porosity of a formation will remain relatively constant, factors which vary with changes in saturated thickness include specific yield, average local porosity, and the volume of water in storage (Buddemeier, R.W. & Schloss, J.A., 2000).

Recharge and Connectivity

The CVGB is recharged by percolation of runoff from the surrounding mountains, percolation of precipitation to the valley floor, and subsurface inflow from the Pinto Valley and Cadiz Valley Groundwater Basins (DWR, 2004a). Subsurface inflow is also received from the Orocopia Valley Groundwater Basin (BLM, 2011a). These groundwater basins are summarized below and considered throughout the impact analysis presented in Section 4.22 of the EIS for the project.

- **Pinto Valley Groundwater Basin.** Recharge to the Pinto Valley Groundwater Basin occurs through percolation of runoff from the surrounding mountains and precipitation to the valley floor and by underflow (DWR, 2004b). The water that infiltrates the ground and reaches the water table percolates through the pore spaces in the water-bearing formations from points of replenishment toward points of discharge (USGS, 2007). Under natural conditions, the only

discharge from the Pinto Valley Groundwater Basin is underflow to the CVGB through unconsolidated deposits between exposures of consolidated rock of the Eagle and Coxcomb Mountains (USGS, 2007). The water table in the Pinto Valley Groundwater Basin is deep enough that groundwater discharge from the transpiration of plants does not occur (USGS, 2007).

- **Cadiz Valley Groundwater Basin.** This basin underlies Cadiz Valley in eastern San Bernardino County. Cadiz Valley drains internally toward Cadiz (dry) Lake, and receives an average annual precipitation rate of 4 to 6 inches. Natural recharge to the Cadiz Valley Groundwater Basin occurs through percolation of surface runoff in stream beds and washes. Surface and groundwater flow direction occurs from the edges of the basin towards Cadiz Dry Lake in San Bernardino County, north of Joshua Tree State Park. (DWR, 2004c)
- **Orocopia Valley Groundwater Basin.** This groundwater basin underlies the Orocopia Valley in central Riverside County, northeast of the Salton Sea. The western portion of the valley drains westward toward the Salton Sea, while the eastern portion of the basin drains eastward toward Hayfield Dry Lake and Chuckwalla Valley. East-trending faults are located along the northern and southern boundaries of the Orocopia Valley Groundwater Basin; the North Chiriaco fault is inferred to extend eastward into Chuckwalla Valley and is known to be a partial barrier to groundwater movement in the Orocopia Valley Groundwater Basin. Natural recharge in this basin occurs from subsurface inflow and infiltration of runoff from the surrounding mountains and rainfall to the valley floor. (DWR, 2004d)

The CVGB is also understood to be hydrologically connected to the Palo Verde Mesa Groundwater Basin, which the CVGB contributes flow to (as opposed to the basins described above, which are understood to contribute flow to the CVGB). The Palo Verde Mesa Groundwater Basin is described below.

- **Palo Verde Mesa Groundwater Basin.** The Palo Verde Mesa Groundwater Basin underlies Parker Valley in eastern Riverside County; this valley is drained by McCoy Wash to the Colorado River. There are no known barriers to groundwater flow in the Palo Verde Mesa Groundwater Basin. Natural recharge to this basin occurs from percolation of runoff from the surrounding mountains, percolation of precipitation to the valley floor, and subsurface inflow from adjacent groundwater basin(s). Recharge by underflow from Chuckwalla Valley Groundwater Basin is estimated to be 400 afy. Groundwater movement occurs southeasterly to Palo Verde Valley. (DWR, 2004e)

The CVGB is up-gradient from the Palo Verde Mesa Groundwater Basin, resulting in subsurface flow from the CVGB and through the Palo Verde Mesa Groundwater Basin toward the Colorado River. Under natural conditions, inflow from the Colorado River to the CVGB is not expected to occur (BLM, 2011a). However, groundwater pumping in the CVGB and surrounding groundwater basins may alter the natural gradient and flow direction of groundwater resources. Such alterations in flow direction would be detectable through groundwater monitoring.

Groundwater Level Trends

As mentioned above, the CVGB is located within the Hayfield Planning Area. As reported in the Basin Plan, groundwater levels in the Hayfield Planning Area range from the ground surface to 400 feet below ground surface (bgs) (Colorado River Basin RWQCB, 2006). Specific to the CVGB, data show stable groundwater levels in the basin in 1963, and groundwater contours in

1979 indicate that groundwater moves from the north and west toward the gap between the Mule and McCoy Mountains at the southeastern end of the valley (DWR, 2004a). The direction of groundwater movement is not anticipated to have changed since the aforementioned 1979 data; however, groundwater level trends may have changed substantially since 1963, due to development of the area and expanded groundwater uses.

Storage Characteristics

The California DWR reports that in 1975 that the total storage capacity of the CVGB was understood to be 9,100,000 acre-feet, and that in 1979 the recoverable storage of this basin was understood to be 15,000,000 acre-feet (DWR, 2004a). It is important to note that “storage capacity” does not reflect the actual amount of groundwater in storage, or the available groundwater supply, but rather is a function of the porosity of subsurface materials and the quantity of water that could theoretically be contained in the subsurface, based on this porosity. According to the DWR, the upper 100 feet of saturated sediments in the CVGB may have 900,000 acre-feet of groundwater in storage (DWR, 2004a).

Safe Yield / Budget

The “safe yield” of a groundwater basin is the maximum quantity of water that can be continuously withdrawn from a groundwater basin without adverse effect (DWR, 2011). Safe yield is affected by the inflow and outflow to a groundwater basin, including groundwater extractions at private wells as well as groundwater management and supply reliability efforts. Groundwater management relevant to the CVGB is discussed in Section 3.3 and Section 4.6 (see “Supply Reliability Considerations”).

The DWR reports that in 1952, extractions from the CVGB totaled 11 acre-feet, increasing to 9,100 acre-feet in 1966 (DWR, 2004a), representing an increase of approximately 816 percent over 14 years. As noted above, the DWR also reports stable groundwater levels throughout the basin in 1963, suggesting that water use was being sustained by basin capacity at that time. However, the DWR reports no more recent estimates of safe yield or groundwater budget for this basin. Therefore, recent studies conducted for other projects in the area are used to characterize existing conditions for groundwater storage and availability, as relevant to the proposed DHSP.

In 1992, a safe yield amount of 12,200 afy was adopted in the EIS for the Eagle Crest Landfill Project; however, this estimate is considered low because the calculation appears to have used an amount of recharge from precipitation that was based on only a portion of the basin (BLM, 2011a). Environmental analysis of the Palen Solar Energy Project (Palen), which also overlies the CVGB, later included a more comprehensive water budget for the CVGB, based on published literature, water budget information from the DWR, data compiled by the California State Prison Authority, and other available information, as discussed below (BLM, 2011a). The Palen budget for the CVGB is based on reliable data and reasonable assumptions, and is therefore used as a basis for updating the CVGB budget for the purposes of this WSA, as shown below in Table WSA-4. This budget is intended to reflect existing conditions at the time of preparation of this WSA for the proposed DHSP.

Table WSA-4. Estimated Budget for the Chuckwalla Valley Groundwater Basin

Budget Component	Acre-Feet per Year
Inflow	
Recharge from Precipitation	9,448
Underflow from Pinto Valley and Orocopia Valley Groundwater Basins ¹	3,500
Irrigation Return Flow	800
Wastewater Return Flow	636
Total Inflow	14,384
Outflow	
Groundwater Extraction	-10,361
Underflow to Palo Verde Mesa Groundwater Basin	-400
Evapotranspiration at Palen Dry Lake	-350
Construction of the Desert Sunlight Solar Project	-650 ²
Total Outflow	-11,761
Budget Balance (Inflow – Outflow)	2,623

1 - As described under "Recharge and Connectivity," the DWR identifies that the CVGB receives underflow from the Pinto Valley and Cadiz Valley Groundwater Basins (DWR, 2004a), while the BLM identifies that the CVGB receives underflow from the Pinto Valley and Orocopia Valley Groundwater Basins (BLM, 2011a). The DWR has not prepared a hydrologic budget for the CVGB or identified the quantity of underflow contributed to the CVGB from the Pinto and Cadiz Valley Groundwater Basins, whereas the BLM has prepared a hydrologic budget for the CVGB and identified the quantity of underflow contributed to the CVGB from the Pinto and Orocopia Valley Groundwater Basins. Therefore, due to the availability of quantitative data, this groundwater budget characterizes underflow from the Pinto and Orocopia Valley Groundwater Basins, but not the Cadiz Valley Groundwater Basin.

2 - Environmental baseline conditions are defined as the existing physical conditions at the time of publication of the Notice of Intent for the Desert Harvest Solar Project (September 15, 2011). The solar field associated with the Desert Sunlight Solar Farm project was under construction at the time of preparation of the Notice of Intent. Table 2.2-2 of the Final EIS prepared for the Desert Sunlight Solar Project (BLM, 2011ab) indicates that construction of the solar field requires a total water supply of 1,200 to 1,300 acre-feet, over a 26-month construction period, or roughly 600 to 650 afy. In order to be conservative, an outflow of 650 afy associated with the Desert Sunlight solar field has been incorporated into the current groundwater budget for the CVGB to characterize baseline conditions.

Source: BLM, 2011a; BLM, 2011b; CEC, 2010.

Table WSA-4 indicates that the current groundwater budget, or total outflow subtracted from total inflow of the CVGB, is approximately 2,623 afy. Each aspect of the CVGB budget presented in Table WSA-4 is discussed in the text following this table.

Recharge from Precipitation

The California DWR has not published an estimated rate of recharge from precipitation to the CVGB, and estimates of recharge from precipitation that have been prepared in support of other projects in the area have had variable results. As described in the footnotes to Table WSA-4, estimates of recharge to the CVGB from precipitation were made for the Palen and Genesis projects (BLM, 2011a; CEC, 2009). Both analyses assessed the quantity of recharge from precipitation by overlaying isohyetal maps over the Chuckwalla watershed boundaries and calculating the volume of average annual precipitation across the valley and bedrock portions of the watershed. Both analyses describe that the Coachella Valley watershed is comprised of the Palen sub-watershed and the Ford sub-watershed, which receive total precipitation in the amounts of 156,000 afy and 159,000 afy, respectively; therefore, the Coachella Valley watershed receives a total precipitation amount of 315,000 afy. The Palen analysis estimated recharge from

precipitation as 3, 5, and 7 percent of total incident precipitation in the watershed, noting that this equates to approximately 8,588, 14,313, and 20,038 afy, respectively (BLM, 2011a). The Genesis analysis estimated recharge from precipitation as a fraction of 2, 3, 5 and 10 percent of total incident precipitation in the watershed, noting that this equates to approximately 6,300, 9,448, 15,750 and 31,500 afy, respectively (CEC, 2009). Both analyses note that studies published by the USGS report approximately 7 to 8 percent of precipitation falling on bedrock mountains in other arid basins goes to mountain front recharge, which would equate to approximately 3 percent of the total precipitation that falls in the Chuckwalla Valley watershed; therefore, both analyses determine that 3 percent of total precipitation falling on the Chuckwalla Valley watershed is the lower estimate of recharge to the CVGB from precipitation. As noted above, total precipitation in the Coachella Valley watershed equates to approximately 315,000 afy; 3 percent of this estimate is approximately 9,450 afy, as described in the Genesis analysis. Therefore, recharge to the CVGB from precipitation is assumed to be 9,448 afy.

Underflow from Pinto Valley and Orocopia Valley Groundwater Basins

As described above in the discussion of “Recharge and Connectivity,” the DWR has identified that CVGB receives underflow from the Cadiz Valley Groundwater Basin (DWR, 2004a); however, the DWR does not identify how much water flows from the Cadiz Valley Groundwater Basin to the CVGB. The Palen budget includes estimates of a quantity of water flowing from the Pinto Valley and Orocopia Valley Groundwater Basins into the CVGB. Therefore, for the purposes of this WSA and due to a lack of quantitative data for the Cadiz Valley Groundwater Basin, safe yield for the CVGB is assumed to include subsurface flow from the Pinto Valley and Orocopia Valley Groundwater Basins, as described below.

Inflow from the Pinto Valley Groundwater Basin has been calculated to be 3,173 afy, while inflow from the Orocopia Valley Groundwater Basin has been estimated to be 1,700 afy. Recent studies reportedly indicate that subsurface inflow from Orocopia Valley Groundwater Basin could be as low as several hundred afy. In order to account for this uncertainty, a combined subsurface inflow rate of 3,500 afy was assumed for both basins. (BLM, 2011a)

As described under “Recharge and Connectivity,” the CVGB is also adjacent to the Palo Verde Mesa Groundwater Basin, but is up-gradient from this basin and groundwater flow is therefore understood to move from the CVGB through the Palo Verde Mesa Groundwater Basin towards the Colorado River. As such, under natural conditions, inflow from the Colorado River to the CVGB is not expected to occur (BLM, 2011a).

Irrigation Return Flow

The amount of applied irrigation water that returns to recharge a groundwater basin depends on the soil, crop type, amount and method of irrigation, and climatic factors. In water budget calculations for the Chuckwalla Planning Area in support of California Water Plan updates, an irrigation return flow of 9 to 11 percent was calculated for 1998, 2000, and 2001, respectively. A 10 percent return flow is therefore considered reasonable for deep percolation from irrigation. Current pumpage associated with irrigation return flow is estimated to be approximately 7,700 afy in the CVGB, accounting for 6,400 afy from agriculture, 215 afy from aquaculture pumping, and 1,090 afy from Tamarisk Lake. Therefore, return flows calculated using the 10 percent factor is approximately 800 afy. (BLM, 2011a)

Wastewater Return Flow

Wastewater return flows from the Chuckwalla and Ironwood State Prisons contribute to the CVGB budget, as well as residential use particularly in the Lake Tamarisk development near Desert Center (BLM, 2011a). Chuckwalla State Prison was constructed in 1988, and Ironwood State Prison became operational in 1994. These prisons use an unlined pond to dispose of treated wastewater, a large percentage of which is reported to infiltrate into the subsurface and recharge the CVGB (BLM, 2011a). For the years 1998 through 2001, the California DWR Department of Planning and Local Assistance (CDWR-DPLA) reported that deep percolation of applied urban water in the Chuckwalla Planning Area (assumed to be wastewater return flow) was 500 to 800 afy. According to authorities at the State prison complex, approximately 600 afy of treated effluent recharges the CVGB. Water budget information for the proposed Eagle Crest Pumped Storage Project indicates 795 afy of treated effluent are recharged by the prisons, but that populations at the prisons are projected to reduce by about 35 percent in order to alleviate over-crowding, and that associated recharge to the CVGB would also reduce to 600 afy (ECE, 2008; FERC, 2012). In order to be conservative for the purposes of this analysis, it is assumed that wastewater return flows from the prisons is approximately 600 afy, accounting for a reduction in prisoner population that could occur during implementation of the proposed project. An additional source of wastewater return flow in the basin is approximately 36 afy from the Lake Tamarisk development near Desert Center (BLM, 2011a). With consideration to the Chuckwalla and Ironwood State Prisons, as well as the Lake Tamarisk development, total wastewater return flow to the CVGB is estimated to be 636 afy.

Groundwater Extraction

Groundwater pumping in the CVGB includes agricultural water demand, pumping for Chuckwalla and Ironwood State prisons, pumping for the Tamarisk Lake development and golf course, domestic pumping, and a minor amount of pumping by Southern California Gas Company. Most of the current groundwater pumping in the CVGB occurs in the western portion of the basin, near the community of Desert Center. Current groundwater pumping rates are estimated to be approximately 7,900 afy in the western CVGB and 2,605 afy in the eastern basin. Agricultural production is limited to the western portion of the basin, with the exception of a relatively limited amount of acreage that is associated with the State prisons. (BLM, 2011a)

As described in a footnote to Table WSA-4, baseline environmental conditions relevant to the CVGB safe yield include groundwater extractions associated with construction of the solar field for the Desert Sunlight Solar Farm project. Water demands associated with renewable energy projects which have been approved but are not yet under construction (at the time of preparation of this WSA) are identified under existing groundwater extractions because these projects have not yet initiated groundwater pumping and consumption. One exception to this is the Genesis Solar Energy Project, which was issued a Notice to Proceed on August 24, 2011, and therefore could have been under active construction by September 15, when the NOI for the DHSP was published. The first month of construction of the Genesis project would entail site preparation, which includes detailed construction surveys, mobilization of construction staff, grading, and preparation of drainage features (BLM, 2010). It is reasonably assumed that if construction of the Genesis project initiated immediately upon issuance of the Notice to Proceed, construction activities requiring the project's full water requirement of 1,368 afy would not have initiated within a few days due to the need to complete site preparation activities (noted above) which

would not require a water source. Water demands associated with the Genesis project as well as other reasonably foreseeable projects in the CVGB are addressed in the water availability projections discussed in Section 4 of this WSA.

Underflow to Palo Verde Mesa Groundwater Basin

As described above in the discussion of “Recharge and Connectivity,” the CVGB contributes subsurface flow to the Palo Verde Mesa Groundwater Basin. Subsurface outflow to the Palo Verde Mesa Groundwater Basin was estimated in 1973 to be 400 afy, based on a cross sectional profile of the boundary between the Palo Verde Mesa Groundwater Basin and the CVGB which was derived using geophysical methods and regional data regarding groundwater gradients and hydraulic conductivity. This estimate was revised in 1986 based on the results of pump testing at Chuckwalla State Prison, resulting in estimated outflow of approximately 870 afy. In 1990, outflow was estimated to be 1,162 afy based on return flow from prison wastewater disposal; however, the rationale for this adjustment was not provided. In 1994, gravity data was used to determine that the area through which discharge occurs is significantly more limited than previously thought due to the presence of a buried bedrock ridge. Therefore, for the purposes of this current estimate of groundwater budget for the CVGB, the most recent available outflow rate is considered to be 400 afy. (BLM, 2011a)

Evapotranspiration at Palen Dry Lake

Groundwater elevation contour mapping suggests that groundwater may occur near the surface beneath approximately the northwestern 25 percent of Palen Lake. Therefore it is considered possible that a portion of Palen Lake is operating as a wet playa. Groundwater levels beneath the southeastern portions of Palen Lake, and a small ancillary playa located approximately one mile southeast of Palen Lake, were reported as being 20 to 30 feet bgs in 1979, suggesting that Palen Lake would be a dry playa at various times. (BLM, 2011a)

Groundwater levels in a well located approximately 2 miles north of Palen Lake were reported to be approximately 20 to 25 feet bgs between 1932 and 1984. Surface elevation at Palen Lake 2 miles to the south of this well is approximately 460 feet above mean sea level (amsl), or 40 feet lower; it therefore appears possible that groundwater levels are very close to the ground surface beneath the northern portion of the playa. It is possible that an area in the northern portion of Palen Lake is discharging groundwater by evaporation as a wet playa. (BLM, 2011a)

Field work conducted in December of 2009 included the implementation of borings to approximately 10 feet bgs in an identified salt pan area in the northwest portion of Palen Dry Lake. The moisture content of the soil was observed to increase with depth in both borings, and free groundwater was encountered at a depth of approximately 8 feet bgs in one of the borings. A depth of 6 to 10 feet bgs is generally the maximum depth of free water documented beneath discharging playas, suggesting that local groundwater could be shallow enough to discharge at the surface by capillary rise and evaporation. (BLM, 2011a)

Groundwater discharge rates were estimated based on reported groundwater discharge rates at other playas, the area of identified salt accumulation in Palen Lake, and an evident episodic or intermittent nature of salt accumulation. Measured evapotranspiration rates at Franklin Lake Playa were used to form a basis for this estimate, calculated to be 38 to 41 cm/year (1.3 to 1.4 feet/year) based on the Energy-Balance Eddy-Correlation method, which is reported to be the

most reliable method by the USGS. These rates are considered a conservative measure of evapotranspiration for active wet playa areas at Palen Lake. (BLM, 2011a)

The total area of potential groundwater discharge at Palen Lake is estimated to be approximately 2,000 acres, with salt pan occupying approximately 700 acres of this total. Due to differences between Palen Lake and Franklin Lake Playa, a groundwater discharge rate that is approximately half that at Franklin Lake Playa was adopted for Palen Lake (approximately 0.0583 feet/acre/month of water), equating to approximately 350 afy over an area of 2,000 acres for three months of the year. (BLM, 2011a)

3.2 Water Rights and Adjudication

The state of California does not have a comprehensive groundwater permit process to regulate the withdrawal of groundwater resources. Groundwater basins may be adjudicated by court decision, wherein a court determines the quantity of groundwater allotted to each landowner with respective rights to the underlying resource. Most groundwater basins in California are not adjudicated, which means that landowners may extract groundwater underlying their property without a permit process for regulation of groundwater use. Groundwater basins that have been adjudicated by court decision, of which there are 22 such basins in California, are subject to management by a court-designated Watermaster.

The CVGB is not an adjudicated basin, which means that overlying land owners may use the groundwater on an “equal and correlative” basis, such that all property owners above a common aquifer possess a shared right to reasonable use of the aquifer, and a user cannot take unlimited quantities without regard to the needs of other users (BLM, 2001). Surplus groundwater may be appropriated for use on non-overlying lands, provided such use will not create overdraft conditions; permits are not required for the use of underlying groundwater, but the appropriation of surplus groundwater is subordinate to the correlative rights of overlying users (BLM, 2001).

3.3 Groundwater Management

No comprehensive groundwater management plan currently exists for the Chuckwalla Valley Groundwater Basin. However, plans and actions have been proposed and/or implemented in the area to address groundwater management and supply reliability are discussed in this section.

Riverside County General Plan

The Riverside County General Plan includes policies to facilitate groundwater recharge. As described in the General Plan, most groundwater basins within Riverside County store local and imported water for later use to meet seasonal and drought-year demands. Under these groundwater recharge programs, groundwater is artificially replenished in wet years with surplus imported water. Water is then extracted during drought years or during emergency situations. In order to facilitate groundwater recharge, the policies listed below are identified in the General Plan. (Riverside County, 2008)

- OS 4.1 – Support efforts to create additional water storage where needed, in cooperation with federal, state, and local water authorities. Additionally, support and/or engage in water banking in conjunction with these agencies where appropriate, as needed.

- OS 4.2 – Participate in the development, implementation, and maintenance of a program to recharge the aquifers underlying the County. The program shall make use of flood and other waters to offset existing and future groundwater pumping, except where:
 - a) groundwater quality would be reduced;
 - b) available groundwater aquifers are full; or
 - c) rising water tables threaten the stability of existing structures.
- OS 4.3 – Ensure that adequate aquifer water recharge areas are preserved and protected.
- OS 4.4 – Incorporate natural drainage systems into developments where appropriate and feasible.
- OS 4.5 – Retain storm water at or near the site of generation for percolation into the groundwater to conserve it for future uses and to mitigate adjacent flooding.
- OS 4.6 – Use natural approaches to managing streams, to the maximum extent possible, where groundwater recharge is likely to occur.

Also as described in the General Plan for Riverside County, groundwater banking is a key factor for meeting future water supply needs in southern California. Historically, groundwater extractions have exceeded natural recharge in this region, resulting in declining water levels and water quality. Using groundwater basins for water banking during wet periods will help alleviate southern California's water supply problems. (Riverside County, 2008)

Chuckwalla Groundwater Storage Program

“Conjunctive use” refers to the deliberate combined use of groundwater and surface water; conjunctive use means actively managing groundwater resources as an underground reservoir. During wet years, surface water is stored underground by recharging the aquifers with surplus surface water and during dry years, the stored water is available in the aquifer system to supplement or replace diminished surface water supplies. (DWR, 2011b)

The *Draft Colorado River Water Use Plan* describes that the MWD has studied a groundwater storage project in the CVGB called the Chuckwalla Groundwater Storage Program as part of an effort to increase its reliable water supply; this plan would store Colorado River water in years when water is available and delivering it to water demand areas when needed (CRBC, 2000). The Chuckwalla Valley is adjacent to the Hayfield Valley and has the capacity to store up to 1.2 million acre-feet of water in the northern portion of the valley (CRBC, 2000). The Chuckwalla Groundwater Storage Program is anticipated to deliver up to 150,000 afy in additional water supplies (Moute & Polyzoides Architects and Urbanists et al., 2008).

Cadiz Project Groundwater Management Plan

As described in Section 3.1 (see “Recharge and Connectivity”), the CVGB receives subsurface inflow from the Cadiz Valley Groundwater Basin (DWR, 2004a). A conjunctive use project is proposed for Cadiz Valley Groundwater Basin that would recharge the basin with Colorado River water and Fenner Gap during wet years and extract it down-gradient during drought years (DWR, 2004c). This project, the Cadiz Project Groundwater Management Plan, would enable MWD to achieve the following: store Colorado River water in the Cadiz Valley Groundwater Basin; pump the quantity of stored Colorado River water and convey it to the Colorado River

Aqueduct when needed; and transfer a portion of naturally occurring/evaporating groundwater from the Cadiz Valley Groundwater Basin to the Colorado River Aqueduct (CRBC, 2000).

4. WATER SUPPLY PLANNING

SB 610 was passed in 2002 and amended the California Water Code by requiring a WSA to be completed for certain projects subject to CEQA, as discussed below in Sections 4.1 and 4.2. California Water Code, as amended by SB 610, requires that when a WSA is required it must address the following questions: Is there a public water system that will service the proposed project (Section 4.3); Is there a current UWMP that accounts for the project demand (Section 4.4); Is groundwater a component of the supplies for the project (Section 4.5); and are there sufficient supplies to serve the project over the next twenty years (Section 4.6). The primary question to be answered in a WSA is:

Will the total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection meet the projected water demand of the proposed project, in addition to existing and planned future uses of the identified water supplies, including agricultural and manufacturing uses?

The following sections address the SB 610 WSA questions as they relate to the proposed Desert Harvest Solar Project. Conclusions are provided in Section 5 of this WSA. Attachment A to this WSA provides a detailed discussion of the steps followed in preparation of this WSA to ensure compliance with SB 610 and California Water Code.

4.1 Is the proposed project subject to CEQA?

California Water Code Section 10910(a) states that any city or county that determines that a project, as defined in Section 10912, is subject to CEQA, which applies to projects requiring an issuance of a permit by a public agency, projects undertaken by a public agency, or projects funded by a public agency. The proposed DHSP requires issuance of permits by a public agency and is, therefore, subject to CEQA.

4.2 Is the proposed project a “project” under SB 610?

California Water Code Section 10912(a) states that any proposed action which meets the definition of “project” under SB 610 is required to prepare a WSA to demonstrate whether sufficient water supplies are available to meet requirements of the proposed project under normal and drought conditions. SB 610 defines a “project” as any one of six different development types with certain water use requirements, as specified in the Water Code revised by SB 610. Each identified development type and associated water requirements are addressed below. Any mixed-use project which incorporates one of the six development types described below is also defined as a “project” under SB 610.

Residential Development

A proposed residential development of more than 500 dwelling units is defined as a “project” under SB 610. The proposed DHSP is not a residential development.

Shopping Center or Business Establishment

A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space is defined as a “project” under SB 610. The proposed DHSP is not a shopping center or residential development.

Commercial Office Building

A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space is defined as a “project” under SB 610. The proposed DHSP is not a commercial office building.

Hotel or Motel

A proposed hotel or motel, or both, having more than 500 rooms is defined as a “project” under SB 610. The proposed DHSP is not a hotel or motel.

Industrial, Manufacturing, or Processing Plant or Industrial Park

A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area is defined as a “project” under SB 610.

The proposed DHSP is not a manufacturing plant, processing plant, or industrial park. The language of SB 610 is not clear on whether renewable energy projects such as the proposed DHSP should be considered an “industrial plant.” If the proposed DHSP is considered to be an industrial plant, it should also be considered a “project” under SB 610 because it would occupy more than 40 acres of land. However, the passing of SB 267 on October 11, 2011 clarified that renewable energy projects are subject to the requirements of SB 610 by amending California Water Law to revise the definition of “project” specified in SB 610. Under SB 267, wind and photovoltaic projects which consume less than 75 afy of water are not considered to be a “project” under SB 610; subsequently, a WSA would not be required for this type of project. SB 267 does not state that renewable energy projects which use more than 75 afy, such as the proposed DHSP, are subject to SB 610 and must prepare a WSA; rather, it clarifies that those renewable projects which use less than 75 afy are not subject to such requirements. Construction of the project would require 400.51 to 500.51 afy of water over the 24-month construction period, while operation of the project would require 26.02 to 39.02 afy. Due to the construction water requirements associated with the proposed project, it has been determined that the DHSP is considered a “project” per SB 610, as clarified by SB 267. Therefore, this WSA has been prepared to satisfy the requirements of SB 610.

4.3 Is there a public water system that will serve the proposed project?

United States Code Title 42 Section 300f(4) describes that the term “public water system” refers to a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves at least twenty five individuals (42 U.S.C. Sec. 300f(4)). The proposed DHSP would not be serviced by a public water system. As described in Section 2, water required during construction and operation of the project would be obtained from groundwater well(s) located on- and/or off-site, and would pump water from the CVGB.

4.4 Is there a current UWMP that accounts for the project demand?

There are a number of UWMPs in Riverside County, including the following: City of Riverside UWMP, Coachella Valley Water Agency UWMP, Desert Water Agency UWMP, Eastern Municipal Water District UWMP, Riverside Highland Water Company UWMP, and Western Municipal Water District UWMP. None of these UWMPs address the proposed DHSP site; there is not a current UWMP that accounts for the project's water demands.

4.5 Is groundwater a component of the supplies for the project?

Yes, water supply requirements for the proposed DHSP would be met using water pumped from the CVGB. During the 24-month construction period for the Project, approximately 400.51 afy of water would be used for fugitive dust control and concrete batching, for a total construction water demand of 801.02 to 1,001.02 acre-feet. Local groundwater would also be used to meet the project's operational water requirements of 26.02 to 39.02 afy for panel washing and use at the O&M building. As previously described, the project's water supply would be pumped from the CVGB.

4.6 Are there sufficient supplies to serve the project over the next twenty years?

In order to determine whether there are sufficient supplies to serve the project over the next twenty years, the data and discussions provided in this section assess project-related water demands and non-project water demands over a twenty-year future projection, including with consideration to average-year, single-dry year, and multiple-dry year (drought) conditions. A number of assumptions have been made to facilitate the water availability projections presented in this section. These assumptions are listed below.

- Inflow to the CVGB from precipitation would be 9,448 afy under normal-year conditions, as identified in the Genesis analysis and discussed in Section 3.1 (CEC, 2009). Estimates of recharge from precipitation during single-dry year and multiple-dry year conditions are discussed below under "Groundwater Supply Availability Projections" and presented in Table WSA-8 (Recharge to CVGB from Precipitation in Varying Climatic Scenarios). As shown in Table WSA-8, it is assumed that a single-dry year would result in 25 percent less recharge from precipitation, while multiple-dry years would result in 15 percent, 30 percent, and 45 percent less recharge from precipitation over a three-year period; these estimates are highly subjective and were selected as a conservative reflection of potential drought conditions. Actual recharge from precipitation during drought years could be substantially more than shown in Table WSA-8.
- Inflow to the CVGB from the Pinto Valley Groundwater Basin (estimated to be 3,173 afy) and the Orocopia Valley Groundwater Basin (estimated to be 1,700 afy) would remain constant over the 20-year projection and under varying climatic scenarios. Actual inflow from these basins may vary, depending upon groundwater usage in those basins, as well as conservation and management efforts.
- Inflow to the CVGB from the Cadiz Valley Groundwater Basin has not been quantified due to a lack of available data, although this basin has been identified by the DWR as being hydrologically connected to the CVGB (DWR, 2004a) and may actually contribute inflow to the CVGB.

- Irrigation return flow to the CVGB would remain constant over the 20-year projection and under varying climatic scenarios. Actual return flow from irrigation may vary, depending upon agricultural practices and climatic variations.
- Wastewater return flow to the CVGB from the Chuckwalla and Ironwood State Prisons would reduce from approximately 800 afy under existing conditions to 600 afy over the lifetime of the project, accounting for a potential 35 percent reduction in prisoner populations. It is possible that the populations of Chuckwalla and Ironwood State Prisons would not reduce over the lifetime of the project, or may increase depending upon the needs of the State and the availability of other prison resources.
- Domestic and agricultural pumping would remain constant at 10,361 afy over the 20-year projection and under varying climatic scenarios. Most of the current groundwater pumping in the CVGB occurs in the western portion of the basin, near the town of Desert Center (BLM, 2011a). The population of Desert Center decreased by nine percent between 2000 and 2011 (AmericanTowns, 2011); it is not anticipated that the population of Desert Center would increase substantially over the 20-year projections such that domestic groundwater pumping would be affected. It is possible that actual domestic pumping rates could decrease, if the negative population trend of Desert Center continues.
- Evapotranspiration at Palen Dry Lake would remain constant at 350 afy over the 20-year projection and under varying climatic scenarios. The actual rate of groundwater discharge at Palen Dry Lake may vary depending on groundwater pumping and climatic conditions.
- Construction and operational water requirements for the proposed DHSP were assumed to be the maximum of the identified ranges. As such, 515 afy would be required during construction, and 39 afy would be required during operation of the project. Construction and operational water usage may be substantially less, particularly depending on climatic conditions; for instance, less water would be needed for construction-related dust suppression or for operational panel-washing during higher-precipitation years.
- All cumulative water uses described in Tables WSA-6 and WSA-7 would occur at the same time as the proposed DHSP. Not all of these uses have been approved or issued final environmental analyses, including the Eagle Creek Pumped Storage Project, which has a notable construction water requirement of 2,380 to 8,066 afy; however, in order to be conservative in water availability projections, all potential water uses are considered.
- All reasonably foreseeable projects identified in Tables WSA-6 and WSA-7 would meet their water supply requirements with groundwater pumped from the CVGB. It is possible that some of these projects may obtain their required water supply from an alternative water source, such as imported water purchased from a local purveyor.

The water balance projections listed in Tables WSA-9 through WSA-15 would be directly affected if the assumptions summarized above are not met. However, these assumptions reflect the worst-case scenario and have therefore been applied to the water availability projections in order to be as conservative as possible for the purposes of this analysis.

Project and Non-Project Water Demands

Water demands of the proposed project and other projects which are anticipated to utilize the Chuckwalla Valley Groundwater Basin are described below, in order to characterize water supply availability.

Project Demands

During the project's 24-month (2-year) construction period, approximately 400.51 to 500.51 afy of water would be required, for a total construction water use of 801.02 to 1,001.02 acre-feet. Construction water would be used for dust suppression, concrete manufacturing, fire safety, and the implementation of mitigation measures. Following the completion of construction, the proposed project would require 26.02 to 39.02 afy for operations and maintenance activities, including panel-washing activities. As described above, in order to be conservative for the purposes of this WSA, it is assumed that the upper estimates of water supply requirements would occur under the proposed project, or 500.51 afy during construction and 39.02 afy during operation and maintenance. Table WSA-5 identifies the proposed project's annual water requirements over a 20-year projection.

Table WSA-5. Proposed DHSP – 20-year Water Use Projections

Year	1	2	3	4	5	6	7	8	9	10
Acre-Feet ¹	500.51	500.51	39.02	39.02	39.02	39.02	39.02	39.02	39.02	39.02
5-year Average	—	—	—	—	183.62	—	—	—	—	39.02
Total	500.51	1,001.02	1,040.04	1,079.06	1,118.08	1,157.10	1,196.12	1,235.14	1,274.16	1,313.18
Year	11	12	13	14	15	16	17	18	19	20
Acre-Feet	39.02	39.02	39.02	39.02	39.02	39.02	39.02	39.02	39.02	39.02
5-year Average	—	—	—	—	39.02	—	—	—	—	39.02
Total	1,352	1,391.22	1,430.24	1,469.26	1,508.28	1,547.30	1,586.32	1,625.34	1,664.36	1,703.38

1 - As described above, the proposed DHSP would require approximately 400.51 to 500.51 afy of water during construction and 26.02 to 39.02 afy of water during operations; in order to be conservative for the purposes of this analysis, it is assumed that the upper estimates for construction and operational water requirements would occur.

Table WSA-5 indicates that the project's water demand would be greatest during the 24-month construction period, and that the highest water demand would occur during the first five years of the project. Over a 20-year projection, overall water use associated with the proposed DHSP would be approximately 1,703.38 acre-feet.

Non-Project Demands

A variety of existing and anticipated non-project water demands utilize the Chuckwalla Valley Groundwater Basin as a water supply source. As described above in Section 4.4, there is no current UWMP which accounts for water demand associated with use of the CVGB. In addition, the DWR does not identify any groundwater management efforts or public or private water agencies within the CVGB (DWR, 2004a), which could provide information on other uses of CVGB groundwater. Projections of non-project water demands have been made using available data, as referenced throughout this section. Table WSA-4 (Estimated Budget for the Chuckwalla Valley Groundwater Basin) indicates that non-project extractions and outflow from the CVGB

include ongoing pumping for agricultural and domestic purposes (10,361 afy), underflow to Palo Verde Mesa Groundwater Basin (400 afy), and evapotranspiration at Palen Dry Lake (350 afy). In addition, other reasonably foreseeable projects in the area are anticipated to use the CVGB as a water supply source. Tables WSA-5 and WSA-6, include water usage information for other projects in the CVGB.

Table WSA-6. Cumulative Projects – Water Use Summary

Project Name	Construction Duration (years)	Annual Construction Water Use (afy)	Annual Operational Water Use (afy)
Chuckwalla Solar I	3	20	40
Palen Solar Power Project	3	426	300
First Solar Desert Sunlight Solar Farm ¹	2.2	600 - 650	0.3
Red Bluff Substation	2.2	150	—
Gen-tie line	1	6.25	—
Devers-Palo Verde 2 Transmission Line Project	3	4	—
Colorado River Substation Expansion	2	66 - 215	—
Blythe Energy Project Transmission Line	2	4	—
Desert Southwest Transmission Line	2	0.6	—
Eagle Crest Pumped Storage Project	4	2,380 – 8,066	1,628
Genesis Solar Energy Project	3	616 – 1,368	1,644
Devers-Palo Verde II Transmission	—	2	—
Blythe Energy Transmission Line	—	2	—
Desert SW Transmission	—	0.3	—

1 - As described in Table WSA-4 (Estimated Budget for the Chuckwalla Valley Groundwater Basin), water use associated with the Desert Sunlight Solar Farm is accounted for in the current estimated budget for the CVGB; for the purpose of evaluating other known and anticipated uses in the CVGB, Desert Sunlight water requirements are considered a cumulative use, as indicated in Table WSA-6.

Source: BLM, 2011a; BLM, 2011b

The following Table WSA-7 provides an extrapolation of the construction and operational water requirements indicated above over a future 20-year period. The water use totals provided in Table WSA-7 are used in calculating the water availability projections which are presented in Tables WSA-9 through WSA-15.

Table WSA-7. Cumulative Projects – Water Use Projections (afy)

Cumulative Projects ¹	Const.	O&M	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019–2043
Western Chuckwalla Valley Groundwater Basin												
Chuckwalla Solar I	20	40	—	20	20	20	40	40	40	40	40	40
Palen Solar Power Project	436	300	—	426	426	436	300	300	300	300	300	300
First Solar Desert Sunlight ²	600–650	0.3	—	—	650	650	0.3	0.3	0.3	0.3	0.3	0.3
Red Bluff Substation	300	—	—	—	150	150	—	—	—	—	—	—
Gen-Tie Line	6.25	—	—	—	—	6.25	—	—	—	—	—	—

Table WSA-7. Cumulative Projects – Water Use Projections (afy)

Cumulative Projects ¹	Const.	O&M	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019–2043
Devers-Palo Verde No. 2 Transmission	2	—	—	2	2	2	—	—	—	—	—	—
Colorado River Substation Expansion ³	66–215	—	—	—	215	66	—	—	—	—	—	—
Blythe Energy Transmission Line	2	—	2	2	—	—	—	—	—	—	—	—
Desert Southwest Transmission Line	0.3	—	—	—	—	0.3	0.3	—	—	—	—	—
Eagle Crest Pumped Storage Startup	2,380 - 8,066	1,628	—	—	—	—	8,066	8,066	8,066	8,066	2,380	1,628
WESTERN SUB-BASIN DEMAND			2	450	1,463	1,330.5	8,406.6	8,406.3	8,406.3	8,406.3	2,720.3	1,968.3
Eastern Chuckwalla Valley Groundwater Basin												
Genesis Solar Energy Project	616–1,368	1,644	616	1,368	616	616	1,644	1,644	1,644	1,644	1,644	1,644
Devers-Palo Verde No. 2 Transmission	2	—	—	2	2	2	—	—	—	—	—	—
Blythe Energy Transmission Line	2	—	2	2	—	—	—	—	—	—	—	—
Desert SW Transmission	0.3	—	—	—	—	0.3	0.3	—	—	—	—	—
EASTERN SUB-BASIN DEMAND			618	1,372	618	618.3	1,644.3	1,644	1,644	1,644	1,644	1,644
Combined Western and Eastern Chuckwalla Valley Groundwater Basin												
			620	1,822	2,081	2,948.85	10,050.9	10,050.3	10,050.3	10,050.3	4,364.3	3,612.3

1 - Status of cumulative projects listed in this table:

- Gen-Tie Line construction would be in the 3rd or 4th quarter of 2012 and would last for an estimated 12 months; due to the late-2012 construction start, it is anticipated that most water use associated with the gen-tie line would occur in 2013.
 - Chuckwalla Solar I has submitted a Plan of Development to BLM
 - Palen Solar Energy Project was approved by the CEC in December of 2010, Final EIS published in May of 2011, proposed to be online in 2012
 - First Solar Desert Sunlight was approved in August of 2011 and was under construction at the time of publication of the Notice of Intent for DHSP (September 15, 2011).
 - Devers-Palo Verde No. 2 Transmission Line Project: BLM issued Record of Decision in July of 2011
 - Colorado River Substation Expansion: Construction anticipated to initiate in December of 2011.
 - Blythe Energy Transmission Line: Existing.
 - Desert Southwest Transmission Line: Approved by BLM in 2006.
 - Eagle Crest Pumped Storage: FERC Draft EIS published in December of 2010.
 - Genesis Solar Energy Project: Currently under construction.
- 2 - The Genesis analysis noted that the Desert Sunlight Solar Farm project would pump 27 afy of groundwater during the construction period and 3.8 afy during the operational period; however, the Final EIS for Desert Sunlight indicates that this project would pump an average of 1,556 afy during construction and less than 0.3 afy during operation. For the purposes of this analysis, the quantities indicated in the Desert Sunlight Final EIS are used.
- 3 - The Colorado River Substation Expansion project would pump 300,000 gallons per day (gpd) over the first four to six months, or a total of 110.5 to 165.7 acre-feet, and 120,000 gpd over the following 18 months, or 198.9; in total, this project is anticipated to pump 309.3 to 364.6 acre-feet over 22 to 24 months, or an average annual rate of 215 afy during the first full year (2012) and 66 afy during the second year. No operational water use has been identified.

Source: CEC, 2009; CEC, 2010; CPUC, 2011; WorleyParsons, 2009

As noted above, the Eagle Crest Pumped Storage Project is anticipated to consume substantially more water than other uses of the CVGB, with construction water requirements ranging from 2,380 to 8,066 afy. The Draft EIS (Federal Energy Regulatory Commission) and EIR (State Water Resources Control Board) for this project were published in 2010, and the Final EIS was

published in January of 2012. At the time of preparation of this WSA, no decision has been made on the Eagle Crest project; however, in order to be conservative in water supply availability projections, it is assumed that the Eagle Crest Pumped Storage Project would be implemented at the same time as the proposed DHSP. Although the Eagle Crest project would require a substantial water supply, some amount of groundwater is also anticipated to be returned to the CVGB through infiltration from reservoir systems proposed under this project. This infiltration, or seepage, is discussed below, under “Supply Reliability Considerations.”

Groundwater Supply Availability Projections

This section considers groundwater supply availability under varying climatic conditions, including normal-year, single-dry-year, and multiple-dry-year. As described in Section 3.1 (Basin Characteristics), under normal-year conditions the CVGB receives an estimated 9,448 afy of recharge from precipitation, or 3 percent of all precipitation received in the watershed. Table WSA-8 shows that in an average year, the Chuckwalla Valley area receives approximately 3.6 inches of precipitation, while high- and low-precipitation months between 1913 and 2008 have been recorded at 5.92 inches and 0 inches, respectively. However, this precipitation data was measured at Blythe Airport, and does not reflect precipitation across the watershed under single-dry year and multiple-dry year scenarios; therefore, assumptions have been made to reflect these conditions, as shown below in Table WSA-8.

Table WSA-8. Recharge to CVGB from Precipitation in Varying Climatic Scenarios

Climate Scenario	Recharge from Precipitation (afy)	Percent of Normal Year
Normal Water Year	9,448	100%
Single-Dry Water Year	7,086	75%
Multiple-Dry Water Year:		
Year 1	8,031	85%
Year 2	6,614	70%
Year 3	5,196	55%

The estimates provided in Table WSA-8 indicate that, for the purposes of this analysis, it is assumed that under single-dry year conditions, the CVGB would receive 25 percent less recharge from precipitation than under a normal water year, and that under multiple-dry year conditions, the CVGB would receive 15 percent, 30 percent, and 45 percent less recharge from precipitation during each of the three years comprising multiple-dry year conditions.

The following tables provide water supply availability projections under each of the climatic scenarios described above, across a future projection of 20 years. In order to simplify this tabular presentation, supply availability projections are presented in five-year increments, with each scenario presented in a separate table. Table WSA-9 shows projections for the year 2013. The footnotes to Table WSA-9 describe calculation inputs; these inputs are the same for Tables WSA-9 through WSA-15 and are therefore not repeated for Tables WSA-10 through WSA-15.

Table WSA-9. Groundwater Availability Projections for Year 1 – 2013*

Climate Scenario	Recharge from Precipitation	Available Supply (afy)	Existing Pumping (afy)	Cumulative Projects Pumping (afy)	DHSP Pumping (afy)	Other Demands	Total Demand (afy)	Balance (afy)
Normal Year	9,448	14,384	10,361	2,948.85	500.51	738	14,559	-164.36
Single Dry Year	7,086	12,022	10,361	2,948.85	500.51	738	14,559	-2,526.36

Table WSA-9. Groundwater Availability Projections for Year 1 – 2013*

Climate Scenario	Recharge from Precipitation	Available Supply (afy)	Existing Pumping (afy)	Cumulative Projects Pumping (afy)	DHSP Pumping (afy)	Other Demands	Total Demand (afy)	Balance (afy)
Multi-Dry Year:								
Year 1	8,031	12,967	10,361	2,948.85	500.51	738	14,559	-1,581.36
Year 2	6,614	11,745	10,361	2,948.85	500.51	738	14,559	-2,903.36
Year 3	5,196	10,327	10,361	2,948.85	500.51	738	14,559	-4,221.36

* Each element of the groundwater availability projections presented in Tables WSA-9 through WSA-15 is described below.

- *Climate Scenario / Recharge from Precipitation.* The climate scenarios considered in this WSA are described in Table WSA-8 (Recharge to CVGB from Precipitation in Varying Climatic Scenarios) and associated text.
- *Available Supply.* Available supply is the total of all predicted inputs to the CVGB, including recharge from precipitation, underflow from Pinto Valley and Orocochia Valley Groundwater Basins, irrigation return flow, and wastewater return flow.
- *Existing Pumping.* Existing pumping is the ongoing rate of groundwater extraction noted in Table WSA-4 (Estimated Budget for the Chuckwalla Valley Groundwater Basin).
- *Cumulative Projects Pumping.* Cumulative projects pumping is the quantity of groundwater pumped by other reasonably foreseeable projects within the CVGB for this particular year; source data is shown in Table WSA-7 (Cumulative Projects – Water Use Projections).
- *DHSP Pumping.* DHSP pumping is the quantity of water anticipated to be pumped for the proposed project in this particular year; source data is shown in Table WSA-5 (Proposed DHSP – Water Use Projections).
- *Other Demands.* Other demands include estimated outflow from the CVGB associated with underflow to Palo Verde Mesa Groundwater Basin (388 afy [WorleyParsons, 2009]) and evapotranspiration at Palen Dry Lake (350 afy [BLM, 2011a]).
- *Total Demand.* Total demand is the sum of Existing Pumping, Cumulative Projects Pumping, DHSP Pumping, and Other Demands.
- *Balance.* The groundwater balance reflects the quantity of water remaining after Total Demand is subtracted from Available Supply; a negative balance reflects overdraft conditions.

Table WSA-9 indicates that under normal water-year conditions with project pumping, there would be a negative groundwater balance of approximately 164 acre-feet. Single-dry year and multiple-dry year conditions would result in a negative groundwater balance ranging from 1,581 to 4,221 acre-feet.

The following table provides groundwater availability projections for 2017 and 2018, years 4 and 5 of the 20-year projection developed for this WSA. Although 2017 is one year prior to the 5-year increments shown in other water availability tables, availability projections for 2017 are included in Table WSA-10 because groundwater pumping associated with cumulative projects is substantially higher in 2017 than in other 5-year increment years.

Table WSA-10. Groundwater Availability Projections for Years 4 and 5 – 2017 and 2018*

Climate Scenario	Recharge from Precipitation	Available Supply (afy)	Existing Pumping (afy)	Cumulative Projects Pumping (afy)	DHSP Pumping (afy)	Other Demands	Total Demand (afy)	Balance (afy)
Year 4 – 2017 (Palen, Genesis, and Eagle Crest projects predicted to consume maximum construction water in 2017)								
Normal Year	9,448	14,384	10,361	10,050	39	684.5	21,135	-6,751
Single Dry Year	7,086	12,022	10,361	10,050	39	684.5	21,135	-9,113
Multi-Dry Year:								
Year 1	8,031	12,967	10,361	10,050	39	684.5	21,135	-8,168
Year 2	6,614	11,745	10,361	10,050	39	684.5	21,135	-9,390
Year 3	5,196	10,327	10,361	10,050	39	684.5	21,135	-10,808

Table WSA-10. Groundwater Availability Projections for Years 4 and 5 – 2017 and 2018*

Climate Scenario	Recharge from Precipitation	Available Supply (afy)	Existing Pumping (afy)	Cumulative Projects Pumping (afy)	DHSP Pumping (afy)	Other Demands	Total Demand (afy)	Balance (afy)
Year 5 – 2018 (Eagle Crest construction water uses predicted to reduce by 109 percent in 2018)								
Normal Year	9,448	14,384	10,361	4,364	39	672	15,436	-1,052
Single Dry Year	7,086	12,022	10,361	4,364	39	672	15,436	-3,414
Multi-Dry Year:								
Year 1	8,031	12,967	10,361	4,364	39	672	15,436	-2,469
Year 2	6,614	11,745	10,361	4,364	39	672	15,436	-3,691
Year 3	5,196	10,327	10,361	4,364	39	672	15,436	-5,109

* Please see footnotes to Table WSA-9 for discussion of the inputs to these water budget calculations.

Table WSA-10 indicates that the CVGB would have an estimated negative balance ranging from 6,751 to 10,808 acre-feet in 2017 and an estimated negative balance ranging from 1,052 to 5,109 acre-feet in 2018, depending on climatic conditions. It is important to note the assumptions used in calculating these estimates. For instance, the estimates shown in Tables WSA-9 through WSA-15 assume that all of the cumulative projects shown in Tables WSA-6 and WSA-7 would be under construction in the years noted. Some projects are anticipated to consume more water than others, and if not all projects are constructed per the schedules shown in Table WSA-7, the CVGB water balance could be substantially affected. For instance, the Eagle Crest Pumped Storage Project is noted as requiring 8,066 afy in years 2014 through 2017. If the Eagle Crest Pumped Storage Project is not constructed and the associated water requirement is not implemented, the water balance of the CVGB shown above in Table WSA-10 would only be negative during the second and third years of the multiple-dry year scenario of 2017. Table WSA-11 provides groundwater availability projections for the year 2023.

Table WSA-11. Groundwater Availability Projections for Year 10 – 2023*

Climate Scenario	Recharge from Precipitation	Available Supply (afy)	Existing Pumping (afy)	Cumulative Projects Pumping (afy)	DHSP Pumping (afy)	Other Demands	Total Demand (afy)	Balance (afy)
Normal Year	9,448	14,384	10,361	3,612	39	606.5	14,619	-234.5
Single Dry Year	7,086	12,022	10,361	3,612	39	606.5	14,619	-2,596.5
Multi-Dry Year:								
Year 1	8,031	12,967	10,361	3,612	39	606.5	14,619	-1,651.5
Year 2	6,614	11,745	10,361	3,612	39	606.5	14,619	-2,873.5
Year 3	5,196	10,327	10,361	3,612	39	606.5	14,619	-4,291.5

* Please see footnotes to Table WSA-9 for discussion of the inputs to these water budget calculations.

Table WSA-11 indicates that the CVGB would have an estimated negative balance ranging from 234.5 to 4,291.5 acre-feet in 2023, depending on climatic conditions. The deficits noted in Table WSA-11 are substantially less than the deficits noted in Tables WSA-9 and WSA-10 for the first, fourth, and fifth years of this analysis, indicating that overdraft conditions are temporary and respond directly to changes in the rates of groundwater pumping. Table WSA-12 provides groundwater availability projections for the year 2028.

Table WSA-12. Groundwater Availability Projections for Year 15 – 2028*

Climate Scenario	Recharge from Precipitation	Available Supply (afy)	Existing Pumping (afy)	Cumulative Projects Pumping (afy)	DHSP Pumping (afy)	Other Demands	Total Demand (afy)	Balance (afy)
Normal Year	9,448	14,384	10,361	3,612	39	549.5	14,562	-177.5
Single Dry Year	7,086	12,022	10,361	3,612	39	549.5	14,562	-2,539.5
Multi-Dry Year:								
Year 1	8,031	12,967	10,361	3,612	39	549.5	14,562	-1,594.5
Year 2	6,614	11,745	10,361	3,612	39	549.5	14,562	-2,816.5
Year 3	5,196	10,327	10,361	3,612	39	549.5	14,562	-4,234.5

* Please see footnotes to Table WSA-9 for discussion of the inputs to these water budget calculations.

Table WSA-12 indicates that the CVGB would have an estimated negative balance ranging from 177.5 to 4,234.5 acre-feet in 2028, depending on climatic conditions. Again, the deficits noted in Table WSA-12 are substantially less than the deficits noted in preceding projections, indicating that overdraft conditions are temporary and respond to changes in the rates of groundwater pumping. Table WSA-13 provides groundwater availability projections for the year 2033, the twentieth year of these projections.

Table WSA-13. Groundwater Availability Projections for Year 20 – 2033*

Climate Scenario	Recharge from Precipitation	Available Supply ⁴ (afy)	Existing Pumping (afy)	Cumulative Projects Pumping (afy)	DHSP Pumping (afy)	Other Demands	Total Demand ³ (afy)	Balance ⁵ (afy)
Normal Year	9,448	14,384	10,361	3,612	39	500	14,506	-128
Single Dry Year	7,086	12,022	10,361	3,612	39	500	14,506	-2,490
Multi-Dry Year:								
Year 1	8,031	12,967	10,361	3,612	39	500	14,506	-1,545
Year 2	6,614	11,745	10,361	3,612	39	500	14,506	-2,767
Year 3	5,196	10,327	10,361	3,612	39	500	14,506	-4,185

* Please see footnotes to Table WSA-9 for discussion of the inputs to these water budget calculations.

Table WSA-13 indicates that the CVGB would have an estimated negative balance ranging from 128 to 4,185 acre-feet in 2033, depending on climatic conditions. Consistent with the estimates and discussion provided for previous tables, the deficits noted in Table WSA-13 continue to indicate that overdraft conditions are temporary, and that overdraft conditions projected to occur during implementation of the project would recover over time.

As described in Section 1 of this WSA, SB 610 requires that a WSA examine water supply availability over a 20-year projection. The 20-year projection relevant to the proposed project's use of CVGB water is provided in Tables WSA-9 through WSA-13, above. This WSA includes further water availability projections over a 30-year period, to account for the anticipated lifetime of the proposed DHSP. Table WSA-14 provides groundwater availability projections for the year 2038, the 25th year of these projections.

Table WSA-14. Groundwater Availability Projections for Year 25 – 2038*

Climate Scenario	Recharge from Precipitation	Available Supply ⁴ (afy)	Existing Pumping (afy)	Cumulative Projects Pumping (afy)	DHSP Pumping (afy)	Other Demands	Total Demand ³ (afy)	Balance ⁵ (afy)
Normal Year	9,448	14,384	10,361	3,612	39	456	14,468	-84
Single Dry Year	7,086	12,022	10,361	3,612	39	456	14,468	-2,446
Multi-Dry Year:								
Year 1	8,031	12,967	10,361	3,612	39	456	14,468	-1,501
Year 2	6,614	11,745	10,361	3,612	39	456	14,468	-2,723
Year 3	5,196	10,327	10,361	3,612	39	456	14,468	-4,141

* Please see footnotes to Table WSA-9 for discussion of the inputs to these water budget calculations.

Table WSA-14 indicates that during the twenty-fifth year of water availability projections, the CVGB would continue to recover from projected overdraft conditions, with an estimated negative balance ranging from 84 to 4,106 acre-feet in 2038, depending on climatic conditions. Table WSA-15 provides groundwater availability projections for the year 2043, the thirtieth year of these projections.

Table WSA-15. Groundwater Availability Projections for Year 30 – 2043*

Climate Scenario	Recharge from Precipitation	Available Supply ⁴ (afy)	Existing Pumping (afy)	Cumulative Projects Pumping (afy)	DHSP Pumping (afy)	Other Demands	Total Demand ³ (afy)	Balance ⁵ (afy)
Normal Year	9,448	14,384	10,361	3,612	39	421	14,433	-49
Single Dry Year	7,086	12,022	10,361	3,612	39	421	14,433	-2,411
Multi-Dry Year:								
Year 1	8,031	12,967	10,361	3,612	39	421	14,433	-1,466
Year 2	6,614	11,745	10,361	3,612	39	421	14,433	-2,688
Year 3	5,196	10,327	10,361	3,612	39	421	14,433	-4,106

* Please see footnotes to Table WSA-9 for discussion of the inputs to these water budget calculations.

Table WSA-15 indicates that during the thirtieth year of water availability projections, the CVGB would continue to recover from projected overdraft conditions, with an estimated negative balance ranging from 49 to 4,141 acre-feet in 2043, depending on climatic conditions.

It is important to consider that the estimates of groundwater balance and overdraft provided in the preceding tables assumes worst-case conditions, in terms of the quantity of water that will be required for the proposed project and for cumulative projects. Further interpretation of the water availability projections presented above in Tables WSA-9 through WSA-15 is provided below, in Section 5 (Conclusions).

Supply Reliability Considerations

As described at the beginning of this section, a number of assumptions and estimates were applied in order to generate the groundwater supply availability projections shown in Tables WSA-9 through WSA-15. Assumptions listed at the beginning of Section 4.6 include the assumption that all reasonably foreseeable projects identified in Tables WSA-6 and WSA-7

would meet their water supply requirements with groundwater pumped from the CVGB. In actuality, other projects' water supply requirements may be met using alternative source(s). For instance, water for the Eagle Crest Pumped Storage Project may be pumped from the CVGB, and/or it may be contracted under a water transfer agreement from MWD's canal system (ECE, 2008). The use of MWD-contracted water instead of CVGB water under this and/or other projects in the cumulative scenario could have a substantial effect on the water availability projections presented above, and could avoid the estimated drought-year groundwater deficits.

The projections shown in Tables WSA-9 through WSA-15 also do not account for groundwater management policies and proposed programs such as described in Section 3.3 (Groundwater Management), which are anticipated to positively influence supply availability. Such policies and programs include conjunctive use programs and groundwater seepage from the Eagle Crest Pumped Storage Project. These and other factors which would positively affect supply availability in the CVGB are summarized below, in Table WSA-16.

Table WSA-16. Water Supply Reliability Considerations

Supply Reliability Factors	Description	Effect on Water Supply
Riverside County General Plan	Policies OS 4.1 through OS 4.6 encourage supply reliability efforts including but not limited to coordination with agencies to implement groundwater banking and conjunctive use programs, develop aquifer recharge programs, preserve drainage and recharge areas.	N/A
Chuckwalla Groundwater Storage Program	This is a conjunctive use program under consideration by MWD that would recharge the CVGB with Colorado River water for storage in years when water is available then extract and deliver this water to demand areas when needed (CRBC, 2000).	Up to an additional 150,000 afy would be stored in the CVGB.
Cadiz Project Groundwater Management Plan	Similar to the Chuckwalla program, this is also a proposed conjunctive use project that would be implemented by MWD. The Cadiz Groundwater Basin may be hydrologically connected to the CVGB, which suggests that increased supply in this basin could also increase flows to the CVGB.	Up to an additional 150,000 afy would be stored in the Cadiz basin; depending on hydrologic connectivity, this could increase flow from the Cadiz basin to the CVGB.
Eagle Crest Pumped Storage Project	This proposed project is a hydroelectric pumped storage project that would use off-peak energy to pump water from a lower reservoir to an upper reservoir. Surface water is currently not stored at the project site; the introduction of surface water in the proposed reservoirs would also recharge the CVGB through infiltration.	600 afy would infiltrate from the pumped storage project's reservoirs to the underlying CVGB (ECE, 2008).

In addition, the EIS for the proposed DHSP identifies several mitigation measures that would avoid adverse impacts to water supply under the proposed project, and ensure water supply reliability during project implementation. These measures are discussed below in Table WSA-17.

Table WSA-17. DHSP Mitigation Measures that Address Water Supply Reliability

Mitigation Number and Title	Summary	Effect(s) on Water Supply Reliability
WAT-2: Alternative Water Source and Groundwater Offsets	This measure requires that an alternative water source is identified and secured via contract prior to the onset of construction, and that the alternative source has sufficient available supply to provide some or all of the water required during construction, operation, and decommissioning. This measure also requires that Chuckwalla Valley groundwater will not be used during years of projected overdraft, and that groundwater offsets will be secured and implemented to avoid contribution of the project to overdraft conditions.	The project would not perpetuate existing or projected overdraft conditions, if present. Through use of alternative water source(s) and implementation of groundwater offsets during overdraft years, the project would avoid contributions to cumulative overdraft conditions in the Chuckwalla Valley Groundwater Basin.
WAT-3: Groundwater Drawdown Monitoring and Reporting Plan	This measure specifies detailed groundwater monitoring, reporting, and coordination with agencies to occur during construction and operation of the project, and requires that project-related pumping would be reduced or ceased if local drawdown of more than 5 feet is detected.	Groundwater monitoring and reporting would ensure that if overdraft and/or drawdown effects occur during project-related pumping, actions would be taken to reduce associated adverse effects.
WAT-6: Drought Water Management and Water Conservation Education Programs	This measure requires the analysis of "severe" drought years per NOAA Palmer Drought Severity methods, and implementation of water conservation and education programs to address such conditions.	Project-related water use would be reduced as much as feasible during drought years.
WAT-7: Colorado River Water Supply Plan	This measure requires groundwater monitoring to determine if the project pumps any water from below the Colorado River accounting surface; if pumping draws water from below 234 feet below ground surface, water conservation measures would be implemented to "replace" the full quantity of such water.	Water conservation measures would be implemented to "replace" any Colorado River water pumped from the CVGB.

The water supply reliability considerations summarized in Table WSA-16 and the DHSP-specific mitigation measures discussed in Table WSA-17 would positively affect groundwater availability in the CVGB, and avoid adverse impacts to groundwater supply during implementation of the proposed DHSP.

5. CONCLUSIONS

It is anticipated that the CVGB would be affected by overdraft conditions during implementation of the proposed DHSP. Such conditions would occur regardless of the proposed project, as the project's maximum operational pumping requirement is approximately 39 afy, while the negative groundwater budget projections identified in Tables WSA-9 through WSA-15 are greater than 39

acre-feet. Tables WSA-9 through WSA-15 show that projected groundwater deficits would decrease over time, including under single-year and multiple-year drought conditions. This indicates that overdraft conditions would be temporary, and that the CVGB would eventually recover from the projected negative water balance years, including under all cumulative water uses identified in Tables WSA-6 and WSA-7.

Groundwater management efforts described in Section 3.3 and in Table WSA-16 would contribute to additional supply in the CVGB, and could avoid the projected groundwater deficits noted in Tables WSA-9 through WSA-15. Mitigation measures and/or alternative water sources associated with other reasonably foreseeable projects in the area would also have the potential to avoid the projected groundwater deficits during drought years. Mitigation measures included under the proposed DHSP ensure that the proposed project would not contribute to overdraft conditions in the CVGB, and that the project would not result in adverse impacts associated with groundwater supply or water supply reliability.

Due to the temporary nature of projected overdraft conditions in the CVGB and the water supply management strategies described above, this WSA concludes that sufficient water is available for the proposed DHSP under normal-year, single-dry year, and multiple-dry year conditions.

This WSA has been prepared in compliance with California Water Code, as amended by SB 610. Attachment A provides a detailed description of the steps followed to prepare this WSA.

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ATTACHMENT A

DWR Guidebook for Implementation of Senate Bill 610

The Water Supply Assessment (WSA) for the proposed Desert Harvest Solar Project (“proposed project”) was prepared using guidance contained in the California Department of Water Resources’ (DWR) *Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001* (DWR Guidebook). The California DWR prepared the Guidebook to assist water suppliers in preparation of the water assessments and the written verification of water supply availability required by Senate Bill 610 and SB 221; the DWR has no regulatory or permitting approval authority concerning water assessments or verifications of sufficient water supply, and provides the Guidebook purely as an assistance tool (DWR, 2003). The following table provides a detailed description of how the DWR Guidebook was used in preparing the proposed project’s WSA.

Table WSA-A1. DHSP WSA Consistency with DWR Guidelines

Guidelines Section Number/Title (DWR, 2003)	Guidelines Direction	Relevant WSA Section and Response
Section 1 (page 2). Does SB 610 or SB 221 apply to the proposed project?	<i>Is the project subject to SB 610?</i>	WSA Section 4.1
	<i>Is the project subject to CEQA (Water Code §10910(a))? If yes, continue.</i>	Yes, the project is subject to CEQA.
	<i>Is it a “Project” as defined by Water Code §10912(a) or (b)? If yes, to comply with SB 610 go to Section 2, page 4.</i>	WSA Section 4.2 Yes, the proposed project is considered to meet the definition of “project” per Water Code §10912(a) or (b).
Section 2 (page 4). Who will prepare the SB 610 analysis?	<i>Is the project subject to SB 221?</i>	No, the proposed project does not include a “subdivision;” SB 221 does not apply to the proposed project, and no further action relevant to SB 221 is required.
	<i>Does the tentative map include a “subdivision” as defined by Government Code §66473.7(a)(1)? If no, stop.</i>	
Section 3 (page 6). Has an assessment already been prepared that includes this project?	<i>Is there a public water system (“water supplier”) for the project (Water Code § 10910(b))? If no, go to Section 3, page 6.</i>	WSA Section 4.3 No, there is no public water system present that would be used to meet the proposed project’s water supply requirements.
	<i>Has this project already been the subject of an assessment (Water Code §10910(h))? If no, go to Section 4, page 8.</i>	No, the proposed project has not been the subject of an assessment.

Table WSA-A1. DHSP WSA Consistency with DWR Guidelines

Guidelines Section Number/Title (DWR, 2003)	Guidelines Direction	Relevant WSA Section and Response
Section 4 (page 8). Is there a current Urban Water Management Plan?	<i>Is there an adopted urban water management plan (Water Code §10910(c))? If yes, continue. If yes, information from the UWMP related to the proposed water demand for the project may also be used for carrying out Section 5, Steps 1 and 2, and Section 7; proceed to Section 5, page 10 of the Guidelines.</i>	WSA Section 4.4 The proposed project site is not addressed in an existing UWMP.
	<i>Is the projected water demand for the project accounted for in the most recent UWMP (Water Code §10910(c)(2))? If no, go to Section 5, page 10.</i>	WSA Section 4.4 The proposed project site is not addressed in an existing UWMP.
Section 5 (page 10). What information should be included in an assessment?	<i>Step One (page 13). Documenting wholesale water supplies.</i>	The proposed project does not include the use of any wholesale water supplies.
	<i>Step Two (page 17). Documenting Supply if Groundwater is a Source*.</i>	The Chuckwalla Valley Groundwater Basin is a proposed water supply.
	a) <i>Specify if a groundwater management plan or any other specific authorization for groundwater management for the basin has been adopted and how it affects the water supplier's use of the basin.</i>	WSA Section 3.3 No comprehensive groundwater management plan currently exists for the Chuckwalla Valley Groundwater Basin.
	b) <i>The description of the groundwater basin may be excerpted from the groundwater management plan, from DWR Bulletin 118, California's Ground Water, or from some other document that has been published and that discusses the basin boundaries, type of rock that constitutes the aquifer, variability of the aquifer material, and total groundwater in storage (average specific yield times the volume of the aquifer).</i>	WSA Chapter 3 of the WSA provides a description of the groundwater basin characteristics using all available resources, including DWR Bulletin 118.
	c) <i>In an adjudicated basin the amount of water the urban supplier has the legal right to pump should be enumerated in the court decision.</i>	WSA Chapter 3 The Chuckwalla Valley Groundwater Basin is not adjudicated.

Table WSA-A1. DHSP WSA Consistency with DWR Guidelines

Guidelines Section Number/Title (DWR, 2003)	Guidelines Direction	Relevant WSA Section and Response
	d) <i>The Department of Water Resources has projected estimates of overdraft, or "water shortage," based on projected amounts of water supply and demand (basin management), at the hydrologic region level in Bulletin 160, California Water Plan Update. Estimates at the basin or subbasin level will be projected for some basins in Bulletin 118. If the basin has not been evaluated by DWR, data that indicate groundwater level trends over a period of time should be collected and evaluated.</i>	WSA Section 3.1 DWR Bulletin 118 has not projected estimates of overdraft specific to the Chuckwalla Valley Groundwater Basin. Groundwater level trends are discussed in WSA Section 3.1.
	e) <i>If the evaluation indicates an overdraft due to existing groundwater extraction, or projected increases in groundwater extraction, describe actions and/or program designed to eliminate the long term overdraft condition</i>	WSA Section 4.6 The evaluation does indicate projected overdraft conditions. Actions and programs that would minimize or avoid overdraft conditions are discussed in WSA Section 4.6 and Chapter 5.
	f) <i>If water supplier wells are plotted on a map, or are available from a geographic information system, the amount of water extracted by the water supplier for the past five years can be obtained from the Department of Health Services, Office of Drinking Water and Environmental Management.</i>	Water pumping on the project site for the proposed project would not initiate until the onset of construction activities; site-specific historical records are not available.
	g) <i>Description and analysis of the amount and location of groundwater pumped by the water supplier for the past five years. Include information on proposed pumping locations and quantities. The description and analysis is to be based on information that is reasonably available, including, but not limited to, historic use records from DWR.</i>	WSA Chapter 2 (Project Description) of the WSA provides a description of the amount and location of groundwater to be pumped for the proposed project. Section 4.6 (see "Project Demands") of the WSA further addresses the proposed project's pumping requirements. Historic groundwater trends are described in WSA Section 3.1.
	h) <i>Analysis of the location, amount, and sufficiency of groundwater that is projected to be pumped by the water supplier.</i>	WSA Chapter 2 and Section 3.1 Water from the Chuckwalla Valley Groundwater Basin would be treated through an on-site reverse osmosis system prior to use for panel washing under the proposed project.

Table WSA-A1. DHSP WSA Consistency with DWR Guidelines

Guidelines Section Number/Title (DWR, 2003)	Guidelines Direction	Relevant WSA Section and Response
	<i>Step 3 (page 21). Documenting project demand (Project Demand Analysis).</i>	WSA Section 4.6 Construction of the proposed project would require 400.51 to 500.51 afy, while operation would require 26.02 to 39.02 afy.
	<i>Step 4 (page 26). Documenting dry year(s) supply.</i>	WSA Section 4.6, see "Groundwater Supply Availability Projections" and Tables WSA-9 through WSA-15.
	<i>Step 5 (page 31). Documenting dry year(s) demand.</i>	WSA Section 4.6, see "Groundwater Supply Availability Projections" and Tables WSA-9 through WSA-15.
Section 6 (page 33). Is the projected water supply sufficient or insufficient for the proposed project?		WSA Chapter 5 (Conclusions) Overdraft conditions are projected to occur during implementation of the proposed project, but sufficient water supplies are available in the are to meet the proposed project's water requirements.
Section 7 (page 35). If the projected supply is determined to be insufficient.	<i>Does the assessment conclude that supply is "sufficient"? If no, continue.</i>	WSA Section 4.6 and Chapter 5 Sufficient water supplies are available for the proposed project.
Section 8 (page 38). Final SB 610 assessment actions by lead agencies.	<i>The lead agency shall review the WSA and must decide whether additional water supply information is needed for its consideration of the proposed project. The lead agency "shall determine, based on the entire record, whether projected water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses."</i>	The WSA for the proposed project will be included as part of the Draft EIS for the proposed project. Per SB 610, the lead agency will approve or disapprove a project based on a number of factors, including but not limited to the water supply assessment.

Appendix F

Noise Calculations

California Vehicle Noise Calculation: Construction Traffic (ALL)

Source: Desert Sunlight Data, Table E2-1

Project Number: 3133.002
Project Name: Desert Harvest Solar Project
Model Description: Reference Energy Mean Emission Levels (REMEL) for California Vehicle Noise, Caltrans Technical Noise Supplement (11/09): Figure 5-9
Model Assumptions: no shielding, no barrier, no traffic flow adjustment (result : highest noise); uniform vehicle class mix
Scenarios: Leq(h) from hour vph; CNEL from ADT vpd-distributed per time fractions

Existing Conditions I-10 West of Highway 177

	Vehicle Distribution Fractions			Number of Hours: (hrs)
	HD Tks	MD Tks	Autos	
Distance: >15m Ref:	15.0 (m)	34.29	5.16	80.55 Fraction
Drop-off (alpha 0.5=soft, 0=hard):	0.00 (alpha)	85.2	81.9	75.5 REMEL (dBA)
Speed:	65 (mph)			
	105 (kph)			

7am-7pm	7pm-10pm	10pm-7am
12	3	9
Backgd Traffic: (%)		
7am-7pm	7pm-10pm	10pm-7am
91	4.7	4.3

SEGMENT/CONDITION	Autos			Leq(h)	Leq(h)	Leq(h)	Leq(h)
	Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Peak (dBA)	Av Day Hr (dBA)
I-10 west of Highway 177	23000	2300.0	1744.2	360.3	109.9	81.72	80.52

65	60	55
Contour	Contour	Contour
CNEL XX CNEL	YY CNEL	ZZ CNEL
(dBA)	(ft)	(ft)
79.6	466.0	1004.1
		2163.2

Source: Desert Sunlight Solar Farm Project Final EIS (April 2011) Appendix E, Noise Analysis, Tables E2-1 and E2-2.

Existing + DHSP: I-10 West of Highway 177

	Vehicle Distribution Fractions			Number of Hours: (hrs)
	HD Tks	MD Tks	Autos	
Distance: >15m Ref:	15.0 (m)	33.93	5.04	61.03 Fraction
Drop-off (alpha 0.5=soft, 0=hard):	0.00 (alpha)	85.2	81.9	75.5 REMEL (dBA)
Speed:	65 (mph)			
	105 (kph)			

7am-7pm	7pm-10pm	10pm-7am
12	3	9
Backgd Traffic: (%)		
7am-7pm	7pm-10pm	10pm-7am
80.4	4.8	5.0

SEGMENT/CONDITION	Autos			Leq(h)	Leq(h)	Leq(h)	Leq(h)
	Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Peak (dBA)	Av Day Hr (dBA)
I-10 west of Highway 177	23550	2355.0	1774.3	363.3	129.8	81.79	80.56

65	60	55
Contour	Contour	Contour
CNEL XX CNEL	YY CNEL	ZZ CNEL
(dBA)	(ft)	(ft)
79.9	482.9	1040.4
		2241.5

I-10 West of SR-177	Existing	Project	E+P
MD-Trucks	1187	0	1187
HD-Trucks	7887	104	7991
Autos	13926	446	14372
TOTAL	23000	550	23550
		MD-Truck % of ADT	5.04%
		HD-Truck % of ADT	33.93%
		Auto % of ADT	61.03%
		check	100.00%

Traffic Hours	Existing	Project	E+P	Traffic %
7am-7pm	20930	362	21292	90.4
7pm-10pm	1081	9	1090	4.6
10pm-7am	989	179	1168	5.0
check	23000	550	23550	100

Basis: Traffic Study, Appendix B (1/19/2012). Peak of 250 workers. 54 people in Normal Crew carpool. Employee trips 446 total. 10pm-7am=155 (34.8%); 7am-7pm=286 (64.1%); 7-10pm = 5 (1.1%) trips. Basis for Equipment: Traffic Study, Distribution of Construction Traffic by Time of Day (1/19/2012). Concrete truck PCE = 180/3 = 60 HD trips/day; Large Equipment PCE = 131/3 = 44 HD trips/day (Total 104).

Source: Desert Sunlight Data, Table E2-1

Existing Conditions I-10 East of Highway 177

	Vehicle Distribution Fractions			Number of Hours: (hrs)
	HD Tks	MD Tks	Autos	
Distance: >15m Ref:	15.0 (m)	37.79	5.61	56.60 Fraction
Drop-off (alpha 0.5=soft, 0=hard):	0.00 (alpha)	85.2	81.9	75.5 REMEL (dBA)
Speed:	65 (mph)			
	105 (kph)			

7am-7pm	7pm-10pm	10pm-7am
12	3	9
Backgd Traffic: (%)		
7am-7pm	7pm-10pm	10pm-7am
91	4.7	4.3

SEGMENT/CONDITION	Autos			Leq(h)	Leq(h)	Leq(h)	Leq(h)
	Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Peak (dBA)	Av Day Hr (dBA)
I-10 east of Highway 177	21400	2140.0	1622.8	335.3	102.2	81.73	80.52

65	60	55
Contour	Contour	Contour
CNEL XX CNEL	YY CNEL	ZZ CNEL
(dBA)	(ft)	(ft)
79.7	466.4	1004.8
		2164.8

I-10 East of SR-177	Existing Conditions	DS Alt 1&2 2012	Delta
ADT	21400	21485	85
MD-Truck % of ADT	5.61%	6.0%	
HD-Truck % of ADT	37.79%	40.3%	
MD-Trucks	1201	1289	89
HD-Trucks	8087	8658	571
Autos	12112	11537	-575 ODD

I-10 East of SR-177	Existing	Project	E+P
MD-Trucks	1201	0	1201
HD-Trucks	8087	104	8191

Source: Desert Sunlight Solar Farm Project Final EIS (April 2011) Appendix E, Noise Analysis, Tables E2-1 and E2-3.

Existing + DHSP: I-10 East of Highway 177

Distance: >15m Ref:	15.0 (m)	HD Tks	MD Tks	Autos	57.21 Fraction
Drop-off (alpha 0.5=soft, 0=hard):	0.00 (alpha)	37.32	85.2	81.9	75.5 REMEL (dBA)
Speed:	68 (mph)				
	105 (kph)				

Vehicle Distribution Fractions			
HD Tks	MD Tks	Autos	Fraction
37.32	85.2	81.9	75.5
REMEL (dBA)			
105	105	105	105

SEGMENT/CONDITION
I-10 east of Highway 177

Autos	Peak	Av Day Hr	Av Eve Hr	Av Nite Hr	Leq(h)
Count	(vpd)	(vph)	(vph)	(vph)	(dBA)
21950	2195.0	1653.0	338.3	122.1	81.79

Leq(h)	Leq(h)	Leq(h)	Leq(h)
Av Day Hr	Av Eve Hr	Av Nite Hr	Peak
80.56	73.67	69.25	81.79

65	60	55
Contour	Contour	Contour
CNEL XX CNE	YY CNE	ZZ CNE
(dBA)	(ft)	(ft)
79.9	484.1	1043.0

Autos	12112	446	12558
TOTAL	21400	550	21950
MD-Truck % of ADT	5.47%	37.32%	57.21%
HD-Truck % of ADT	57.21%	100.00%	

Traffic Hours Existing	Project	E+P	Traffic %
7am-7pm	19474	362	19836
7pm-10pm	1006	9	1015
10pm-7am	920	179	1099
check	21400	550	21950

Basis: Traffic Study, Appendix B (1/19/2012). Peak of 250 workers. 54 people in Normal Crew carpool. Employee trips 446 total. 10pm-7am=155 (34.8%); 7am-7pm=286 (64.1%); 7-10pm = 5 (1.1%) trips. Basis for Equipment: Traffic Study, Distribution of Construction Traffic by Time of Day (1/19/2012). Concrete truck PCE = 180/3 = 60 HD trips/day; Large Equipment PCE = 131/3 = 44 HD trips/day (Total 104).

Existing Conditions Highway 177 South of Kaiser Road

Distance: >15m Ref:	15.0 (m)	HD Tks	MD Tks	Autos	61.6 Fraction
Drop-off (alpha 0.5=soft, 0=hard):	0.00 (alpha)	27.5	10.9	71.1	71.1 REMEL (dBA)
Speed:	50 (mph)				
	80 (kph)				

Vehicle Distribution Fractions			
HD Tks	MD Tks	Autos	Fraction
27.5	10.9	71.1	71.1
REMEL (dBA)			
80	80	80	80

SEGMENT/CONDITION
Highway 177 south of Kaiser Road

Autos	Peak	Av Day Hr	Av Eve Hr	Av Nite Hr	Leq(h)
Count	(vpd)	(vph)	(vph)	(vph)	(dBA)
2925	292.5	172.1	82.7	68.0	70.90

Leq(h)	Leq(h)	Leq(h)	Leq(h)
Av Day Hr	Av Eve Hr	Av Nite Hr	Peak
68.59	65.41	64.56	70.90

65	60	55
Contour	Contour	Contour
CNEL XX CNE	YY CNE	ZZ CNE
(dBA)	(ft)	(ft)
72.0	143.2	308.5

SR-177 s.o. Kaiser Rd.	Existing Conditions	DS Alt 1&2 2012	Delta
ADT	2250	2475	225
MD-Truck % of ADT	4.40%	5.7%	
HD-Truck % of ADT	9.60%	9.5%	
MD-Trucks	99	141	42
HD-Trucks	216	235	19
Autos	1935	2099	164

Source: Desert Harvest Traffic Study (Dec 2011), Appendix B, Traffic Counts.

Existing + DHSP: Highway 177 South of Kaiser Road

Distance: >15m Ref:	15.0 (m)	HD Tks	MD Tks	Autos	64.72 Fraction
Drop-off (alpha 0.5=soft, 0=hard):	0.00 (alpha)	26.13	9.15	71.1	71.1 REMEL (dBA)
Speed:	50 (mph)				
	80 (kph)				

Vehicle Distribution Fractions			
HD Tks	MD Tks	Autos	Fraction
26.13	9.15	71.1	71.1
REMEL (dBA)			
80	80	80	80

SEGMENT/CONDITION
Highway 177 south of Kaiser Road

Autos	Peak	Av Day Hr	Av Eve Hr	Av Nite Hr	Leq(h)
Count	(vpd)	(vph)	(vph)	(vph)	(dBA)
3475	347.5	202.3	85.7	87.9	71.41

Leq(h)	Leq(h)	Leq(h)	Leq(h)
Av Day Hr	Av Eve Hr	Av Nite Hr	Peak
69.06	65.33	65.44	71.41

65	60	55
Contour	Contour	Contour
CNEL XX CNE	YY CNE	ZZ CNE
(dBA)	(ft)	(ft)
72.7	159.8	344.2

Traffic Hours Existing	Project	E+P	Traffic %
7am-7pm	2065	362	2427
7pm-10pm	248	9	257
10pm-7am	612	179	791
check	2925	550	3475

Basis: Traffic Study, Appendix B (1/19/2012). Peak of 250 workers. 54 people in Normal Crew carpool. Employee trips 446 total. 10pm-7am=155 (34.8%); 7am-7pm=286 (64.1%); 7-10pm = 5 (1.1%) trips. Basis for Equipment: Traffic Study, Distribution of Construction Traffic by Time of Day (1/19/2012). Concrete truck PCE = 180/3 = 60 HD trips/day; Large Equipment PCE = 131/3 = 44 HD trips/day (Total 104).

Existing + DHSP + DS: Highway 177 South of Kaiser Road

SEGMENT/CONDITION	Vehicle Distribution Fractions					Number of Hours: (hrs)						
	HD Tks	MD Tks	Autos	Fraction	REME (dBA)	7am-7pm	7pm-10pm	10pm-7am				
	15.0 (m)	25.05	9.73	65.22		12	3	9				
	Distance: >15m Ref:	0.00 (alpha)	83.0	79.0	71.1	Backgd Traffic: (%)						
	Drop-off (alpha 0.5=soft, 0=hard):	80 (mph)				7am-7pm	7pm-10pm	10pm-7am				
Highway 177 south of Kaiser Road	3700	370.0	212.4	85.7	99.3	68.9	6.9	24.2				

SEGMENT/CONDITION
Highway 177 south of Kaiser Road

CUMULATIVE

SR-177 s.o. Kaiser Rd.

E+P

Desert Sunlight

E+P+DS

MD-Trucks	318	42	360
HD-Trucks	908	19	927
Autos	2249	164	2413
TOTAL	3475	225	3700
		MD-Truck % of ADT	9.73%
		HD-Truck % of ADT	25.06%
		Auto % of ADT	65.22%
		check	100.00%

Traffic Hours E+P

Desert Sunlight

E+P+DS

Traffic %

7am-7pm	2427	122	2549	68.9
7pm-10pm	257	0	257	6.9
10pm-7am	791	103	894	24.2
check	3475	225	3700	100

Basis: Desert Sunlight FEIS, Section 4.10 "Construction truck traffic was assumed to be all heavy trucks, and to occur between 7:00 AM and 3:00 PM. Construction-related worker commute traffic was assumed to be a mix of light duty vehicles and medium trucks (shuttle buses). All arriving worker commute traffic was assumed to occur between 6:00 AM and 7:00 AM, and to depart between 3:00 PM and 4:00 PM.

Existing Conditions Kaiser Road South of Lake Tamarisk

SEGMENT/CONDITION	Vehicle Distribution Fractions					Number of Hours: (hrs)						
	HD Tks	MD Tks	Autos	Fraction	REME (dBA)	7am-7pm	7pm-10pm	10pm-7am				
	15.0 (m)	17.30	14.40	68.40		12	3	9				
	Distance: >15m Ref:	0.00 (alpha)	82.1	77.8	69.3	Backgd Traffic: (%)						
	Drop-off (alpha 0.5=soft, 0=hard):	45 (mph)				7am-7pm	7pm-10pm	10pm-7am				
Kaiser Road south of Lake Tamarisk	556	55.6	36.9	7.7	10.0	79.68	4.14	16.19				

SEGMENT/CONDITION
Kaiser Road south of Lake Tamarisk

Source: Desert Harvest Traffic Study (Dec 2011), Appendix B, Traffic Counts.

Source: Desert Sunlight Data, Table E2-1

Kaiser Rd. s.o. Tamarisk Lake

Existing Conditions

Alt 1&2 2012

Delta

ADT	150	372	222
MD-Truck % of ADT	20.40%	24.8%	
HD-Truck % of ADT	6.50%	21.5%	
MD-Trucks	30	92	62
HD-Trucks	10	80	70
Autos	110	200	90

EXISTING TRAFFIC COUNTS 22-Nov-11

Kaiser Rd. s.o. Tamarisk Lake

Existing

Project

E+P

MD-Trucks	80	0	80
HD-Trucks	96	104	200
Autos	380	446	826
TOTAL	556	550	1106
		MD-Truck % of ADT	7.23%
		HD-Truck % of ADT	18.08%
		Auto % of ADT	74.68%
		check	100.00%

Traffic Hours Existing

Project

E+P

Traffic %

7am-7pm	443	362	805	72.8
7pm-10pm	23	9	32	2.9
10pm-7am	90	179	269	24.3
check	556	550	1106	100

Basis: Traffic Study, Appendix B (1/19/2012). Peak of 250 workers. 54 people in Normal Crew carpool. Employee trips 446 total. 10pm-7am=155 (34.8%); 7am-7pm=286 (64.1%); 7-10pm = 5 (1.1%) trips.
Basis for Equipment: Traffic Study, Distribution of Construction Traffic by Time of Day (1/19/2012).
Concrete truck PCE = 180/3 = 60 HD trips/day; Large Equipment PCE = 131/3 = 44 HD trips/day (Total 104).

Existing + DHSP + DS: Kaiser Road South of Lake Tamarisk

SEGMENT/CONDITION	Vehicle Distribution Fractions						Number of Hours: (hrs)								
	HD Tks	MD Tks	Autos	Fraction	68.98	REMED (dBA)	7am-7pm	7pm-10pm	10pm-7am	12	3	9	65	60	55
	Distance: >15m Ref:	15.0 (m)	20.33	10.89	68.98	Fraction	7am-7pm	7pm-10pm	10pm-7am	12	3	9	65	60	55
	Drop-off (alpha 0.5=soft, 0=hard):	0.00 (alpha)	82.1	77.8	69.3	REMED (dBA)	7am-7pm	7pm-10pm	10pm-7am	12	3	9	65	60	55
Kaiser Road south of Lake Tamarisk	Speed:	45 (mph)	72	(kph)			7am-7pm	7pm-10pm	10pm-7am	12	3	9	65	60	55
		72 (kph)					71.6	2.4	28.0						
	Autos	Count	Peak	Av Day Hr	Av Eve Hr	Av Nite Hr	Leq(h)	Leq(h)	Leq(h)	Leq(h)	Leq(h)	Leq(h)	Leq(h)	Leq(h)	Leq(h)
		(vpd)	(vph)	(vph)	(vph)	(vph)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
	1328	132.8	79.3	10.7	38.3	65.96	63.72	55.01	60.57	67.5	71.8	154.8	333.4		

CUMULATIVE

Kaiser Rd. s.o. Tamarisk Lake	E+P	Desert Sunlight	E+P+DS	
MD-Trucks	80	62	142	
HD-Trucks	200	70	270	
Autos	826	90	916	
TOTAL	1106	222	1328	
		MD-Truck % of ADT	10.7%	
		HD-Truck % of ADT	20.3%	
		Auto % of ADT	69.0%	
		check	100.0%	
Traffic Hours	E+P	Desert Sunlight	E+P+DS	Traffic %
7am-7pm	805	146	951	71.6
7pm-10pm	32	0	32	2.4
10pm-7am	269	76	345	26.0
check	1106	222	1328	100

Basis: Desert Sunlight FEIS, Section 4.10 "Construction truck traffic was assumed to be all heavy trucks, and to occur between 7:00 AM and 3:00 PM. Construction-related worker commute traffic was assumed to be a mix of light duty vehicles and medium trucks (shuttle buses). All arriving worker commute traffic was assumed to occur between 6:00 AM and 7:00 AM, and to depart between 3:00 PM and 4:00 PM.

Existing Conditions Kaiser Road North of Lake Tamarisk

Existing Conditions Kaiser Road North of Lake Tamarisk			Vehicle Distribution Fractions				Number of Hours: (hrs)			
			HD Tks	MD Tks	Autos		7am-7pm	7pm-10pm	10pm-7am	
Distance: >15m Ref:	15.0 (m)		2.50	19.30	78.20	Fraction	12	3	9	
Drop-off (alpha 0.5=soft, 0=hard):	0.00 (alpha)		82.1	77.8	69.3	REMED (dBA)				
Speed:	45 (mph)									
	72 (kph)						82.35	3.36	14.29	

Source: Desert Harvest Traffic Study (Dec 2011), Appendix B, Traffic Counts.

Existing + DHSP: Kaiser Road North of Lake Tamarisk

Existing + DHSP: Kaiser Road North of Lake Tamarisk		Vehicle Distribution Fractions					Number of Hours: (hrs)					
		HD Tks	MD Tks	Autos	Fraction		7am-7pm	7pm-10pm	10pm-7am			
Distance: >15m Ref:	15.0 (m)	15.99	3.44	80.57			12	3	9			
Drop-off (alpha 0.5=soft, 0=hard):	0.00 (alpha)	82.1	77.8	69.3	REMED (dBA)							
Speed:	45 (mph)											
	72 (kph)											
							Backgd Traffic: (%)					
							7am-7pm	7pm-10pm	10pm-7am			
							68.8	1.9	29.3			
SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h)	Leq(h)	Leq(h)	Contour	60	55
							Av Day Hr (dBA)	Av Eve Hr (dBA)	Av Nite Hr (dBA)	CNEL (ft)	YY CNEL (ft)	ZZ CNEL (ft)
Kaiser Road north of Lake Tamarisk	669	66.9	38.3	4.3	21.8	61.85	59.44	49.97	56.98	63.7	40.4	86.9 187.3

Source: Desert Sunlight Data, Table E2-1

Kaiser Rd. n.o. Tamarisk Lake	Existing Conditions	Alt 1&2 2012	Delta
ADT	108	330	222
MD-Truck % of ADT	20.4%	24.8%	
HD-Truck % of ADT	6.5%	21.5%	
MD-Trucks	22	82	60
HD-Trucks	7	71	64
Autos	79	177	98

EXISTING TRAFFIC COUNTS 22-Nov-11

Kaiser Rd. n.o. Tamarisk Lake	Existing	Project	E+P	Traffic %
MD-Trucks	23	0	23	
HD-Trucks	3	104	107	
Autos	93	446	539	
TOTAL	119	550	669	
		MD-Truck % of ADT	3.4%	
		HD-Truck % of ADT	16.0%	
		Auto % of ADT	80.6%	
		check	100.0%	
Traffic Hours	Existing	Project	E+P	Traffic %
7am-7pm	98	362	460	68.8
7pm-10pm	4	9	13	1.9
10pm-7am	17	179	196	29.3
check	119	550	669	100

Basis: Traffic Study, Appendix B (1/19/2012). Peak of 250 workers. 54 people in Normal Crew carpool. Employee trips 446 total. 10pm-7am=155 (34.8%); 7am-7pm=286 (64.1%); 7-10pm = 5 (1.1%) trips. Basis for Equipment: Traffic Study, Distribution of Construction Traffic by Time of Day (1/19/2012). Concrete truck PCE = 180/3 = 60 HD trips/day; Large Equipment PCE = 131/3 = 44 HD trips/day (Total 104).

Existing + DHSP + DS: Kaiser Road North of Lake Tamarisk

Vehicle Distribution Fractions			
HD Tks	MD Tks	Autos	Fraction
19.19	9.32	71.49	
82.1	77.8	69.3	REMEI (dBA)
Distance: >15m Ref: 15.0 (m)			
Drop-off (alpha 0.5=soft, 0=hard): 0.00 (alpha)			
Speed: 45 (mph)			
72 (kph)			

Number of Hours: (hrs)		
7am-7pm	7pm-10pm	10pm-7am
12	3	9
Backgd Traffic: (%)		
7am-7pm	7pm-10pm	10pm-7am
67.7	1.5	30.9

CUMULATIVE

Kaiser Rd. n.o. Tamarisk Lake	E+P
MD-Trucks	23
HD-Trucks	107
Autos	539
TOTAL	669

Desert Sunlight	E+P+DS
23	60
107	64
539	98
669	222
MD-Truck % of ADT	9.3%
HD-Truck % of ADT	19.2%
Auto % of ADT	71.5%
check	100.0%

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	XX CNEL (ft)	YY CNEL (ft)	ZZ CNEL (ft)
Kaiser Road north of Lake Tamarisk	891	89.1	50.3	4.3	30.6	63.99	61.50	50.86	59.34	66.0	57.3	123.5	266.1

Basis: Desert Sunlight FEIS, Section 4.10 "Construction truck traffic was assumed to be all heavy trucks, and to occur between 7:00 AM and 3:00 PM. Construction-related worker commute traffic was assumed to be a mix of light duty vehicles and medium trucks (shuttle buses). All arriving worker commute traffic was assumed to occur between 6:00 AM and 7:00 AM, and to depart between 3:00 PM and 4:00 PM.

Appendix G

Visual Resources

Appendix G-1

SECTION 1 - Approach to Baseline Analysis Under the BLM Visual Resource Management (VRM) System

The Federal Land Policy and Management Act of 1976 (FLPMA) identifies scenic resources as one of the resources for which public lands should be managed. In order to satisfy its responsibilities with respect to scenic resources, the BLM's Visual Resource Management (VRM) Policy establishes a visual assessment methodology to inventory and manage scenic values on lands under its jurisdiction. The BLM manual M-8400 (Visual Resource Management), Handbook H-8410 (Visual Resource Inventory), Handbook H-8431 (Visual Resource Contrast Rating), and Instruction Memorandum 2009-167 (Application of the VRM Program to Renewable Energy) set forth the policies and procedures for determining visual resource values, establishing management objectives, and evaluating proposed actions for conformance with established objectives for BLM administered public lands.

The three primary elements of the BLM's VRM Policy are: (1) determining resource values, (2) establishing management objectives, and (3) evaluating the conformance of proposed actions with those objectives (each of which is described briefly below).

- **Determining Resource Values:** The primary means to establish visual resource values is through a Visual Resource Inventory (VRI) that results in the assignment of one of four VRI Classes (I to IV) to represent the relative visual value of an area. VRI Class I has the highest value and VRI Class IV has the lowest. VRI Class I is reserved for special congressional designations or administrative decisions such as Wilderness Areas, visually sensitive ACECs, or Wild and Scenic Rivers, etc. VRI Classes II through IV are determined through a systematic process that documents the landscape's scenic quality, public sensitivity and visibility. Rating units for each of the three factors are mapped individually, evaluated, and then combined through an over-layering analysis. The three factors contributing to the VRI Class determination are described below. The combined factors are then cross-referenced with the VRI Matrix to determine the applicable VRI Class. VRI classes are informational in nature and provide a baseline for existing conditions. They do not establish management direction and should not be used as a basis for constraining or encouraging surface disturbing activities. They provide the baseline data for existing conditions.
- **Establishing Management Objectives:** VRM Classes (defined below) are determined through careful consideration of VRI Class designations (visual values), land use and demands, and the resource allocations and/or management decisions made in the applicable land use plan for a given area. VRM Class designations set the level of visual change to the landscape that may be permitted for any surface-disturbing activity. The objective of VRM Class I is to preserve the character of the landscape, whereas VRM Class IV provides for activities that require major modification to the landscape. VRI Classes are not intended to automatically become VRM Class designations. VRM Classes may be different than the VRI Classes assigned during the inventory, as the former should reflect a balance between the protection of visual values and other resource use needs. For example, an area with a VRI Class II designation may be assigned a VRM Class IV designation, based on its overriding value for mineral resource extraction or its designation as a utility corridor.

- **Evaluating Conformance:** Finally, proposed plans of development are evaluated for conformance to the VRM Class objectives through the use of the Visual Resource Contrast Rating process set forth within BLM Handbook H-8431-1.

Factors Contributing to VRI Class Determination

VRI Class determination is based on an assessment of scenic quality, viewer sensitivity, and viewing distance zones. The following paragraphs address each of these contributing factors.

Scenic Quality is a measure of the overall impression or appeal of an area created by the physical features of the landscape, such as natural features (landforms, vegetation, water, color, adjacent scenery, and scarcity) and built features (roads, buildings, railroads, agricultural patterns, and utility lines). These features create the distinguishable form, line, color, and texture of the landscape composition that can be judged for scenic quality using criteria such as distinctiveness, contrast, variety, harmony, and balance. Table G-1-1 presents the scenic quality rating components that are evaluated to arrive at one of three scenic quality ratings (A, B, or C) for a given landscape. Each landscape component is scored, and a score of 19 or higher results in a Class A scenic quality rating. A score of 12 to 18 results in a Class B scenic quality rating, while a score of 11 or less results in a Class C scenic quality rating. The three scenic quality classes are described as follows:

- **Scenic Quality Class A** – Landscapes that combine the most outstanding characteristics of the region.
- **Scenic Quality Class B** – Landscapes that exhibit a combination of outstanding and common features.
- **Scenic Quality Class C** – Landscapes that have features that are common to the region.

Viewer Sensitivity is a factor used to represent the value of the visual landscape to the viewing public, including the extent to which the landscape is viewed. For example, a landscape may have high scenic qualities but be remotely located and, therefore, seldom viewed. Sensitivity considers such factors as visual access (including duration and frequency of view), type and amount of use (See Table G-1-2), public interest, adjacent land uses, and whether the landscape is part of a special area (e.g., California Desert Conservation Area [CDCA] or Area of Critical Environmental Concern). The three levels of viewer sensitivity can generally be defined as follows.

- **High Sensitivity.** Areas that are either designated for scenic resources protection or receive a high degree of use (includes areas visible from roads and highways receiving more than 45,000 visits [vehicles] per year). Typically within the foreground/middleground (f/m) viewing distance (see Table G-1-3).
- **Medium Sensitivity.** Areas lacking specific, or designated, scenic resources protection but are located in sufficiently close proximity to be within the viewshed of the protected area. Includes areas that are visible from roads and highways receiving 5,000 to 45,000 visits (vehicles) per year. Typically within the background (b) viewing distance (see Table G-1-3).
- **Low Sensitivity.** Areas that are remote from populated areas, major roadways, and protected areas or are severely degraded visually. Includes areas that are visible from roads and highways receiving less than 5,000 visits (vehicles) per year.

All of the BLM lands in the vicinity of the proposed project and alternatives are located within the CDCA. Because of the public importance imparted by this designation, BLM lands within the CDCA are generally assigned a High rating for Viewer Sensitivity.

Viewing Distance Zones. Landscapes are generally subdivided into three distance zones based on relative visibility from travel routes or observation points (see Table G-1-3). The f/m zone includes areas that are less than three to five miles from the viewing location. The f/m zone defines the area in which landscape

details transition from readily perceived to outlines and patterns. The b zone is generally greater than five, but less than 15, miles from the viewing location. The b zone includes areas where landforms are the most dominant element in the landscape, and color and texture become subordinate. In order to be included within this distance zone, vegetation should be visible at least as patterns of light and dark. The seldom-seen (s/s) zone includes areas that are usually hidden from view as a result of topographic or vegetative screening or atmospheric conditions. In some cases, atmospheric and lighting conditions can reduce visibility and shorten the distances normally covered by each zone (BLM 1986b).

Table G-1-1. Scenic Quality Rating

Component		Scenic Quality Rating		
Landform	High vertical relief (prominent cliffs, spires, or massive rock outcrops); severe surface variation; highly eroded formations (major badlands or dune systems); detail features dominant and exceptionally striking/intriguing. 5	Steep canyons, mesas, buttes, cinder cones, and drumlins; interesting erosional patterns or variety in size and shape of landforms; or detail features, which are interesting though not dominant or exceptional. 3	Low rolling hills, foothills, or flat valley bottoms or few or no interesting landscape features. 1	
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. 5	Some variety of vegetation but only one or two major types. 3	Little or no variety or contrast in vegetation. 1	
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. 5	Flowing, or still, but not dominant in the landscape. 3	Absent or present but not noticeable. 0	
Color	Rich color combinations; variety or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snow fields. 5	Some intensity or variety in colors and contrast of the soil, rock, and vegetation but not a dominant scenic element. 3	Subtle color variations, contrast, or interest; generally muted tones. 1	
Influence of Adjacent Scenery	Adjacent scenery greatly enhances visual quality. 5	Adjacent scenery moderately enhances overall visual quality. 3	Adjacent scenery has little or no influence on overall visual quality. 0	
Scarcity	One of a kind, unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. 5+	Distinctive, though somewhat similar to others within the region. 3	Interesting within its setting but fairly common within the region. 1	
Cultural Modifications	Modifications add favorably to visual variety while promoting visual harmony. 2	Modifications add little or no visual variety to the area and introduce no discordant elements. 0	Modifications add variety but are very discordant and promote strong disharmony. - 4	
Scenic Quality Rating: A = 19 or more		B = 12 to 18		C = 11 or less

* A rating of greater than 5 can be given but must be supported by written justification

Table G-1-2. Amount of Use Classifications

Type Area	High	Moderate	Low
Roads & Highways	More than 45,000 visits/yr	5,000 to 45,000 visits/yr	Less than 5,000 visits/yr
Rivers & Trails	More than 20,000 visits/yr	2,000-20,000 visits/yr	Less than 2,000 visits/yr
Recreation Sites	More than 10,000 visitor-days/yr	2,000-10,000 visitor-days/yr	Less than 2,000 visitor-days/yr

Table G-1-3. Distance Zones

f/m (foreground/middleground).....	0 to 3–5 miles
b (background)	5-15 miles
s/s.....	seldom seen areas

Visual Resource Inventory Classes. The VRI class for a given area is typically arrived at through the use of a classification matrix similar to that presented in Table G-1-4. By comparing the scenic quality, visual sensitivity, and distance zone, the specific VRI class can be determined. The exception to this process is the Class I designation, which is placed on special areas where management activities are restricted (e.g., wilderness areas).

Table G-1-4. Visual Resource Inventory (VRI) Classification Matrix

Visual Sensitivity Levels		High			Medium			Low
Special Areas		I	I	I	I	I	I	I
Scenic Quality	A	II	II	II	II	II	II	II
	B	II	III	III*	III	IV	IV	IV
				IV*				
C		III	IV	IV	IV	IV	IV	IV
Distance Zones		f/m	b	s/s	f/m	b	s/s	s/s

* If adjacent areas are Class III or lower, assign Class III; if higher, assign Class IV.

The objectives of each VRI classification as stated in the BLM *Visual Resource Inventory Manual* are as follows.

- **VRI Class I.** The objective is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- **VRI Class II.** The objective is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- **VRI Class III.** The objective is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate or lower. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- **VRI Class IV.** The objective is to provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements in the predominant natural features of the characteristic landscape.

Approach Under the CDCA Plan

According to BLM policy (BLM Manual H-8410-1) Interim Visual Resource Management (VRM) classes are established where a project is proposed and there are no approved VRM objectives in the applicable land use plan, as is the case for the DHSP project site which is governed by the CDCA Plan. These interim classes must 1) consider the area's visual values as summarized in the latest visual resource inventory results and 2) be consistent with the multiple-use objectives and use allocations set

forth in the plan which covers the project area. While a comprehensive plan amendment is underway (Desert Renewable Energy Conservation Plan) which will establish long-term VRM classifications for the entire CDCA Plan area, the CDCA Plan currently does not have established VRM objectives. Therefore, until this landscape-level plan amendment is completed the BLM is establishing interim VRM classes consistent with H-8410-1 for project level actions within the CDCA planning area, such as the DHSP.

An analysis of scenic quality, viewer sensitivity and distance zones in the most recent Visual Resource Inventory (VRI) for the project area concluded that the inventory class is VRI II (see above for a complete discussion of VRI). The CDCA plan allocation for the project area is Multiple Use Class (MUC) M, which allows for solar electric facilities. Specific projects must be evaluated through a plan amendment to ensure consistency with all goals and objectives for this class. The conformity of the Proposed Action with the CDCA Plan's Energy Production and Utility Corridors Element Decision Criteria is shown in Table 3.22-2.

Mitigation measures VR-1 through VR-5 will be implemented to minimize the visual impacts of the project. However, the level of contrast with the surrounding landscape will still be high when viewed from a variety of vantage points including elevated viewpoints in surrounding wilderness areas and along I-10. Taking the inventory class into consideration, recent developments that have been undertaken and/or approved in the project area, the employment of mitigation measures, and the project's consistency with the MUC, an interim VRM Class IV has been established for the project area. The objective of this class is "to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic visual elements.

SECTION 2 - Approach to Impact Analysis Under the VRM System

The factors considered in determining impacts on visual resources included: (1) scenic quality of the project site and vicinity; (2) available visual access and visibility, and frequency and duration that the landscape is viewed; (3) viewing distance and degree to which project components would dominate the view of the observer; (4) resulting contrast of the project components or activities with existing landscape characteristics; (5) the extent to which project features or activities would block views of higher value landscape features; and (6) the level of public interest in the existing landscape characteristics and concern over potential changes.

An *adverse visual impact* occurs within public view when: (1) an action perceptibly changes existing features of the physical environment so that they no longer appear to be characteristic of the subject locality or region; (2) an action introduces new features to the physical environment that are perceptibly uncharacteristic of the region and/or locale; or (3) aesthetic features of the landscape become less visible (e.g., partially or totally blocked from view) or are removed. Changes that seem uncharacteristic are those that appear out of place, discordant, or distracting. The degree of the visual impact depends upon how noticeable the adverse change may be. The noticeability of a visual impact is a function of project features, context, and viewing conditions (angle of view, distance, primary viewing directions, and duration of view).

Impacts on visual resources within the study area could result from various activities including structure and line construction, substation construction, establishment of construction staging areas and access roads, and project operation or presence of the built facilities.

CONTRAST ANALYSIS METHODOLOGY

Under the BLM's VRM methodology, the proposed project and alternatives were analyzed for their effects on visual resources using an assessment of the visual contrast within the landscape created by components of the project. Impacts to the inventoried visual resource values and conformance with Interim VRM Class Objectives are evaluated through a contrast rating process described below. The degree to which the proposed action and alternatives adversely affect the visual quality of a landscape is directly related to the amount of visual contrast between the alternative and the existing landscape character. Visual Contrast Ratings were conducted using the BLM's VRM System manuals (BLM 1984, 1986a). The Visual Contrast Rating Forms are provided in Appendix G-4. Under the VRM System, the degree to which a project or activity affects the visual quality of a landscape depends on the visual contrast created between the project components and the major features, or predominant qualities, in the existing landscape. Visual contrast evaluates a project's consistency with the visual elements of form, line color, and texture already established in the viewshed. In a sense, visual contrast indirectly indicates a particular landscape's ability to absorb a project's components and location without resulting in an uncharacteristic appearance. Other elements that are considered in evaluating visual contrast include the degree of natural screening by vegetation and landforms; placement of structures relative to existing vegetation, landforms and other structures; distance from the point of observation; and relative size or scale of a project. Once the degree of anticipated contrast is determined (ranging from none to strong), a conclusion on the overall level of change is made (ranging from very low to high) and compared to the applicable VRM class objective for a determination of conformance with the Interim VRM Class objectives.

For the DHSP, the applicable Interim VRM Class is **VRM Class IV**. The management objective for VRM Class IV (as previously noted) is as follows:

- **VRM Class IV.** The objective is to provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements in the predominant natural features of the characteristic landscape.

BLM's VRM Policy does not require VRM Classes to be used as a method to preclude all other resource development. However, it does require that visual values be considered and that those considerations be documented as part of the decision-making process, and that if resource development/extraction is approved, a reasonable attempt must be made to meet the VRM objectives for the area in question and to minimize the visual impacts of the proposal. Because the CDCA Plan does not have Resource Management Plan-approved VRM objectives, a land use plan amendment is not necessarily required to address instances of non-conformance. Nevertheless, the overall goal remains minimizing visual impacts through mitigation measures. In addition to the permanent visual contrast created in the landscape, the proposed action and alternatives are analyzed for adverse effects due to lighting and glare, visible dust plumes, as well as temporary construction-related disturbances.

VISUAL SIMULATIONS

To prepare the visual simulations for each KOP, appropriately scaled polygons were first constructed in Google Earth at each structure location. A Google Earth perspective view was then achieved to match a KOP existing view photograph. The perspective view image was then layered with the existing view image and the constructed polygons were used as guides for appropriately scaling and placing individual

wind turbine images into the existing view photograph, which was then saved as the simulation image. A similar process was used for the access roads.

MITIGATION APPROACH

Mitigation for visual resources impacts resulting from energy infrastructure and similar types of industrial facilities typically focuses on methods to minimize the visibility of the resulting visual change either by screening the change from view or by blending the change with the background (by selective use of coloration and/or screening). By their very nature, transmission structures tend to be large and exposed, and thus, difficult to either hide from view or blend into the background. Also problematic is the grading associated with the solar facility construction, and construction of permanent access and structure spur roads and “temporary” cleared areas that become persistent in arid and semi-arid landscapes where vegetation recruitment and growth are slow. These features often cause unnatural and discordant demarcations in the vegetation landscape that increase the visual contrast of project activities.

However, in some cases there are techniques that can reduce the prominence of land scarring and vegetation changes though they may not reduce the impact. The following techniques were considered where appropriate for the proposed project and alternatives:

- Require revegetation and restoration efforts to mitigate the unnatural demarcation in vegetation landscapes caused by removal of or changes in the vegetation within the project area as a result of clearing and maintenance.
- Consider alternative low-impact construction techniques to minimize prominent land scarring visible to sensitive viewpoints.

For each of the visual impacts identified, the mitigation approaches discussed above were evaluated for applicability and likelihood of success. In almost all cases, the combination of existing landscape characteristics and structure prominence and visibility resulted in impacts that could not be mitigated. However, where mitigation opportunities were identified, they are discussed.

References

- U.S. Department of the Interior, Bureau of Land Management (BLM). 1986. *Visual Resource Inventory Manual H-8410-1*.
- _____. 1986. *Visual Resource Contrast Rating Manual 8431*.
- _____. 1984. *Visual Resource Management Manual 8400*.
- _____. 1980, as amended 1999. *California Desert Conservation Area Plan*.

Appendix G.2

Summary of Key Observation Point Analyses

APPENDIX G-2

DESERT HARVEST SOLAR FARM PROJECT EIS/CDCA PLAN AMENDMENT: VISUAL RESOURCES – SUMMARY OF KEY OBSERVATION POINT ANALYSES

ALTERNATIVE 4 - PROPOSED SOLAR PROJECT										
VIEWPOINT		BLM - EXISTING VISUAL SETTING				BLM - VISUAL CONTRAST ANALYSIS		CEQA IMPACT SIGNIFICANCE		
Key Observation Point (KOP)	Description	Scenic Quality Classification	Viewer Sensitivity	VRM Class			Level of Change (See Appendix G4 Contrast Rating Worksheets)	VRM Consistency	Before Mitigation After Mitigation	Mitigation
				Status	Rating	Management Objective				
KOP 1 Joshua Tree Wilderness – Eagle Mountains Proposed Project Figures 4.19-1A / 1B	View to the south from a low ridge at the northeast extent of the Eagle Mountains, at the north end of Chuckwalla Valley.	Class C This panoramic vista encompasses the open expanse of the northern Chuckwalla Valley, backdropped by the Chuckwalla Mountains to the south and the Eagle Mountains to the west. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of tans, browns, and muted greens. Although the rugged and visually interesting landforms of the Eagle and more distant Chuckwalla Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	High These lands are within the California Desert Conservation Area and are within the foreground/middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Cockscomb Mountains. This location is near an access point to JNP.	Interim	IV	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	Low The Proposed project would result in the introduction of barely discernible built structures that, at an approximately eight-mile viewing distance, would appear as a low, narrow, light-colored, horizontal line along the valley floor (solar farm), and faintly visible, vertical structural elements. The resulting structural visual contrast for form, line, color, and texture would be weak (relative to the natural character of the existing landscape). Also, view impairment of the valley floor or other background landforms would be minimal.	Consistent The low level of change would be allowed under the VRM Class IV management objective.	BEFORE: Less than Significant (Class III) AFTER: Same	VR-1 through VR-6
KOP 2 Joshua Tree Wilderness – Cockscomb Mountains Proposed Project Figures 4.19-2A / 2B	View to the southwest from an elevated vantage point along the western flank of the Cockscomb Mountains, northeast of the project site.	Class C This panoramic vista and elevated overlook of the northern Chuckwalla Valley also encompasses the Chuckwalla Mountains to the south and the Eagle Mountains to the west. This elevated view captures the variety of colors that are manifested in the soils, rocks, vegetation, and erosional patterns of the Chuckwalla Valley floor. The angular to low horizontal and rugged forms of the background Chuckwalla and Eagle Mountains provide features of additional visual interest. While some localized areas of ground disturbance are noticeable at this middleground viewing distance, they are not prominent features and the landscape is predominantly natural in appearance, though relatively non-descript and common to much of the Chuckwalla Valley.	High These lands are within the California Desert Conservation Area and are within the foreground/middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Cockscomb Mountains.	Interim	IV	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	Moderate to High The Proposed project would result in the introduction of a large-scale complex of built structures and graded surfaces forming a spatially and visually prominent series of geometric patterns on the valley floor, that would contrast with the predominantly natural appearance of the northern Chuckwalla Valley landscape and background Chuckwalla and Eagle Mountains. The color and reflective characteristics of the panel support structures would contribute to the noticeable contrast with existing earthtone colors.	Consistent The moderate to high level of change would be allowed under the VRM Class IV management objective.	BEFORE: Significant (Class I) AFTER: Same	VR-1 through VR-6

APPENDIX G-2

DESERT HARVEST SOLAR FARM PROJECT EIS/CDCA PLAN AMENDMENT: VISUAL RESOURCES – SUMMARY OF KEY OBSERVATION POINT ANALYSES

ALTERNATIVE 4 - PROPOSED SOLAR PROJECT (continued)										
VIEWPOINT		BLM - EXISTING VISUAL SETTING					BLM - VISUAL CONTRAST ANALYSIS		CEQA IMPACT SIGNIFICANCE	
Key Observation Point (KOP)	Description	Scenic Quality Classification	Viewer Sensitivity	VRM Class			Level of Change (See Appendix G4 Contrast Rating Worksheets)	VRM Consistency	Before Mitigation After Mitigation	Mitigation
				Status	Rating	Management Objective				
KOP 3 Kaiser Road in the Immediate Project Vicinity Proposed Project Figures 4.19-3A / 3B	View to the east from Kaiser Road, in the immediate vicinity of the project site.	Class C This view encompasses the open expanse of a central portion of the Chuckwalla Valley, backdropped by the southern extent of the Coxcomb Mountains and the more distant Palen Mountains. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of tans, browns, and muted greens. Although the rugged and visually interesting landforms of the nearby Coxcomb Mountains and more distant Palen Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	High These lands are within the California Desert Conservation Area and are within the foreground/middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains.	Interim	IV	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	Moderate to High The Proposed Action would result in the introduction of visually prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The solar farm would appear as prominent horizontal and geometric features with prominent horizontal lines associated with specific panel arrays, development units, and demarcations from graded surfaces. The resulting form and line contrast of the solar panels would be moderate to strong (relative to the natural character of the existing landscape). The color and texture of the solar panels would result in moderate degrees of visual contrast. Also, the solar panels would cause partial view blockage of the Chuckwalla Valley floor.	Consistent The moderate-to-high level of change would be allowed under the VRM Class IV management objective.	BEFORE: Significant (Class II) AFTER: Less than Significant	VR-1 through VR-6
KOP 4 Desert Lily Sanctuary ACEC Proposed Project Figures 4.19-4A / 4B	View to the west from the Desert Lily Sanctuary ACEC, just east of SR 177.	Class C This view encompasses a central portion of the Chuckwalla Valley, backdropped by the Eagle Mountains to the west. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of tans, browns, and greens. Also visible is a wood-pole utility line. Although the rugged and visually interesting landforms of the Eagle Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	High These lands are within the California Desert Conservation Area and are within the foreground/middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains.	Interim	IV	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	Very Low The Proposed Action would result in the introduction of barely discernible built structures that, at an approximately 5.5 mile viewing distance, and the presence of substantial intervening vegetation, would be barely noticeable along the valley floor. Neither the solar farm nor the transmission line structures would be perceived as prominent features in the landscape, and view impairment of the valley floor or other background landforms would be minimal. The resulting structural form and line contrast would be weak, and there would be no discernible color or texture contrast, when viewed from the Desert Lily Sanctuary ACEC.	Consistent The very low level of change would be allowed under the VRM Class IV management objective.	BEFORE: Less than Significant (Class III) AFTER: Same	VR-1 through VR-6

APPENDIX G-2
DESERT HARVEST SOLAR FARM PROJECT EIS/CDCA PLAN AMENDMENT: VISUAL RESOURCES – SUMMARY OF KEY OBSERVATION POINT ANALYSES

ALTERNATIVE 7 – HIGH PROFILE REDUCED FOOTPRINT										
VIEWPOINT		BLM - EXISTING VISUAL SETTING					BLM - VISUAL CONTRAST ANALYSIS		CEQA IMPACT SIGNIFICANCE	
Key Observation Point (KOP)	Description	Scenic Quality Classification	Viewer Sensitivity	VRM Class			Level of Change (See Appendix G4 Contrast Rating Worksheets)	VRM Consistency	Before Mitigation	Mitigation
				Status	Rating	Management Objective			After Mitigation	
KOP 1A Joshua Tree Wilderness – Eagle Mountains Alternative 7 High-Profile Solar Project Figures 4.19-1A / 1C	View to the south from a low ridge at the northeast extent of the Eagle Mountains, at the north end of Chuckwalla Valley.	Class C This panoramic vista encompasses the open expanse of the northern Chuckwalla Valley, backdropped by the Chuckwalla Mountains to the south and the Eagle Mountains to the west. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of tans, browns, and muted greens. Although the rugged and visually interesting landforms of the Eagle and more distant Chuckwalla Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	High These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains. This location is near an access point to JTNP.	Interim	IV	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	Low Alternative 7 would result in the introduction of a noticeable horizontal, built feature, which, at an approximately eight-mile viewing distance, would appear as a low, narrow, variably-colored, horizontal line along the valley floor (solar farm), and faintly visible, vertical structural elements (gen-tie line). The resulting structural visual contrast for form and texture would be weak. For line and color, the resulting visual contrast would be weak to moderate (relative to the natural character of the existing landscape). Also, view impairment of the valley floor or other background landforms would be minimal.	Consistent The low level of change would be allowed under the VRM Class IV management objective.	BEFORE: Less than Significant (Class III) AFTER: Same	VR-1 through VR-6
KOP 3A Kaiser Road in the Immediate Project Vicinity Alternative 7 High-Profile Solar Project Figures 4.19-3C / 3D	View to the northeast from Kaiser Road, in the immediate vicinity of the project site.	Class C This view encompasses the open expanse of a central portion of the Chuckwalla Valley, backdropped by the Coxcomb Mountains. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of tans, browns, and muted greens. Although the rugged and visually interesting landforms of the nearby Coxcomb Mountains and more distant Palen Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	High These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains.	Interim	IV	To provide for management activities, that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	High Alternative 7 would result in the introduction of visually prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The solar farm would appear as prominent horizontal and geometric features with prominent horizontal lines associated with specific panel arrays, development units, and demarcations from graded surfaces. The resulting form and color contrasts of the solar panels would be moderate to strong (relative to the natural character of the existing landscape). The line contrast of the solar panels would be strong and the texture contrast would be moderate. Also, the solar panels would cause partial view blockage of the Chuckwalla Valley floor and background Coxcomb and Palen Mountains.	Consistent The high level of change would be allowed under the VRM Class IV management objective.	BEFORE: Significant (Class I) AFTER: Same	VR-1 through VR-6

APPENDIX G-2

DESERT HARVEST SOLAR FARM PROJECT EIS/CDCA PLAN AMENDMENT: VISUAL RESOURCES – SUMMARY OF KEY OBSERVATION POINT ANALYSES

ALTERNATIVE 7 – HIGH PROFILE REDUCED FOOTPRINT (continued)										
VIEWPOINT		BLM - EXISTING VISUAL SETTING					BLM - VISUAL CONTRAST ANALYSIS		CEQA IMPACT SIGNIFICANCE	
Key Observation Point (KOP)	Description	Scenic Quality Classification	Viewer Sensitivity	VRM Class			Level of Change (See Appendix G4 Contrast Rating Worksheets)	VRM Consistency	Before Mitigation	Mitigation
				Status	Rating	Management Objective			After Mitigation	
KOP 8A Westbound I-10 Alternative 7 High-Profile Solar Project Figures 4.19-8C / 8D	View to the northwest from westbound I-10, north of the proposed Red Bluff Substation site, approximately 5.75 miles east of Desert Center, and approximately 0.2 mile east of the Alternative E Gen-Tie route span of I-10.	Class C This view to the north captures a central portion of the northern Chuckwalla Valley. The open expanse of the valley floor includes a foreground to middleground flat desert landscape that is generally natural appearing and supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of muted yellows, tans, browns, and greens. Although the rugged and visually interesting landforms of the Eagle and Coxcomb Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	High These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of I-10, SR 177 (Rice Road), the Desert Lily Sanctuary ACEC, the Alligator Rock ACEC, and the Chuckwalla Mountains Wilderness.	Interim	IV	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	Moderate to High This Alternative would result in the introduction of numerous visually noticeable to prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The solar array, tubular steel poles, and curvilinear conductors would result in moderate-to-strong levels of form and line contrast relative to the natural character of the existing landscape. Color contrast would be moderate (notably the variable colors of the solar array depending on time of day, orientation of the tracking panels, and characteristics of the reflected sky). Texture contrast would be weak. Also, the solar array and transmission line would cause noticeable view blockage of the background Chuckwalla Valley floor and Eagle and Coxcomb Mountains.	Consistent The moderate-to-high level of change would be allowed under the VRM Class IV management objective.	BEFORE: Significant (Class I) AFTER: Same	VR-1 through VR-6
ALTERNATIVES B AND C GEN-TIE ROUTES										
KOP 5 Northbound Kaiser Road Near Lake Tamarisk Alternative B and C Gen-Tie Routes Figures 4.19-5A / 5B	View to the north-northwest from northbound Kaiser Road, near the community of Lake Tamansk.	Class C This view toward the open expanse of Chuckwalla Valley west of Kaiser Road and the Eagle Mountains beyond, is partially obscured by roadside vegetation. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of muted yellows, tans, browns, and greens. Although the rugged and visually interesting landforms of the Eagle Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	High These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of I-10, Kaiser Road, SR 177 (Rice Road), Alligator Rock ACEC, and Joshua Tree Wilderness in the Eagle Mountains.	Interim	IV	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	High This Alternative would result in the introduction of visually prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The tubular steel poles and curvilinear conductors would result in strong levels of form and line contrast relative to the natural character of the existing landscape. Color contrast would be moderate and texture contrast would be weak to moderate. Also, the transmission line would cause substantial view blockage of the background Eagle Mountains.	Consistent The high level of change would be allowed under the VRM Class IV management objective.	BEFORE: Significant (Class I) AFTER: Same	VR-3 and VR-4

APPENDIX G-2

DESERT HARVEST SOLAR FARM PROJECT EIS/CDCA PLAN AMENDMENT: VISUAL RESOURCES – SUMMARY OF KEY OBSERVATION POINT ANALYSES

ALTERNATIVE D GEN-TIE ROUTE										
VIEWPOINT		BLM – EXISTING VISUAL SETTING					BLM - VISUAL CONTRAST ANALYSIS		CEQA IMPACT SIGNIFICANCE	
Key Observation Point (KOP)	Description	Scenic Quality Classification	Viewer Sensitivity	VRM Class			Level of Change (See Appendix G4 Contrast Rating Worksheets)	VRM Consistency	Before Mitigation After Mitigation	Mitigation
				Status	Rating	Management Objective				
KOP 6 Eastbound I-10 East of Desert Center Alternative D Gen-Tie Route Figures 4.19-6A / 6B	View to the northeast from eastbound I-10, east of Desert Center and approximately 0.8 mile west of the Alternative D Gen-Tie route span of I-10.	Class C This view toward the open expanse of Chuckwalla Valley north of I-10, includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of muted yellows, tans, browns, and greens. Although the rugged and visually interesting landforms of the Palen Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	High These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of I-10, Kaiser Road, SR 177 (Rice Road), Alligator Rock ACEC, and Chuckwalla Mountains Wilderness.	Interim	IV	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	High This Alternative would result in the introduction of visually prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The tubular steel poles and curvilinear conductors would result in strong levels of form and line contrast relative to the natural character of the existing landscape. Color and texture contrasts would be weak to moderate. Also, the transmission line would cause substantial view blockage of the background Palen Mountains.	Consistent The high level of change would be allowed under the VRM Class IV management objective.	BEFORE: Significant (Class I) AFTER: Same	VR-3 and VR-4
ALTERNATIVE E GEN-TIE ROUTE										
KOP 7 Northbound SR 177 Alternative E Gen-Tie Route Figures 4.19-7A / 7B	View to the northeast from northbound SR 177, approximately 0.3 mile southwest of the Alternative E Gen-Tie route span of SR 177.	Class C This view toward the Alternative E Gen-Tie route, SR 177 span location, captures a central portion of the northern Chuckwalla Valley where it is bisected by SR 177. The open expanse of valley floor is partially obscured by roadside vegetation. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of muted yellows, tans, browns, and greens. Although the rugged and visually interesting landforms of the Coxcomb and more distant Palen Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	High These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of I-10, Kaiser Road, SR 177 (Rice Road), and Joshua Tree Wilderness in the Coxcomb Mountains.	Interim	IV	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	Moderate to High This Alternative would result in the introduction of visually prominent built structures into a landscape generally lacking structures of similar scale and industrial or technological character. The associated moderate to strong visual contrast of the tubular steel poles and curvilinear conductors is somewhat moderated by the linear forms and vertical lines of an existing wood-pole utility line adjacent to SR 177. Color contrast would be moderate and texture contrast would be weak to moderate. Also, the transmission line would cause considerable view blockage of the background Coxcomb and Palen Mountains.	Consistent The moderate-to-high level of change would be allowed under the VRM Class IV management objective.	BEFORE: Significant (Class I) AFTER: Same	VR-3 and VR-4

APPENDIX G-2

DESERT HARVEST SOLAR FARM PROJECT EIS/CDCA PLAN AMENDMENT: VISUAL RESOURCES – SUMMARY OF KEY OBSERVATION POINT ANALYSES

ALTERNATIVE E GEN-TIE ROUTE (continued)										
VIEWPOINT		BLM - EXISTING VISUAL SETTING					BLM - VISUAL CONTRAST ANALYSIS		CEQA IMPACT SIGNIFICANCE	
Key Observation Point (KOP)	Description	Scenic Quality Classification	Viewer Sensitivity	VRM Class			Level of Change (See Appendix G4 Contrast Rating Worksheets)	VRM Consistency	Before Mitigation	Mitigation
				Status	Rating	Management Objective			After Mitigation	
KOP 8 Westbound I-10 Alternative E Gen-Tie Route Figures 4.19-8A / 8B	View to the north from westbound I-10, north of the proposed Red Bluff Substation site, approximately 5.75 miles east of Desert Center, and approximately 0.2 mile east of the Alternative E Gen-Tie route span of I-10.	Class C This view to the north captures a central portion of the northern Chuckwalla Valley. The open expanse of the valley floor includes a foreground to middleground flat desert landscape that is generally natural appearing and supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of muted yellows, tans, browns, and greens. Although the rugged and visually interesting landforms of the Coxcomb Mountains and more distant Palen Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	High These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of I-10, SR 177 (Rice Road), the Desert Lily Sanctuary ACEC, the Alligator Rock ACEC, and the Chuckwalla Mountains Wilderness.	Interim	IV	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	Moderate to High This Alternative would result in the introduction of numerous visually noticeable to prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The tubular steel poles and curvilinear conductors would result in moderate-to-strong levels of form and line contrast relative to the natural character of the existing landscape. Color contrast would be weak to moderate and texture contrast would be weak to moderate. Also, the transmission line would cause noticeable view blockage of the background Chuckwalla Valley floor and Coxcomb and Palen Mountains.	Consistent The moderate-to-high level of change would be allowed under the VRM Class IV management objective.	BEFORE: Significant (Class I) AFTER: Same	VR-3 and VR-4

Appendix G.3

Scenic Quality Field Inventory

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Field Office: Palm Springs

D06000

Date: 10/6/2009

Scenic Quality Rating Unit: Chuckwalla Valley

Time (24hr format): 11:50

Unit Number: 21

1. Evaluators: CBrandt GLong

2. LANDSCAPE CHARACTER (Features)

	A. Landform/Water	B. Vegetation	C. Structures
Form	Broad valley; flat to gentle slopes; very gently rolling	Rounded, clumpy, mottled form	Roads, settlements, substations, power lines, tall cylindrical poles; geometric
Line	Horizontal landscape; vast open space	Rounded, horizontally aligned	Vertical poles, buildings
Color	Light brown to buff-colored soils and rock	Brownish-green	White, beige, desert brown, silver, brown
Texture	Smooth valley floor	Mottled; medium to coarse vegetation	Smooth surfaces

3. Narrative:

A broad, enclosed landscape surrounded on most sides by dramatic mountain ranges. Vast, natural-appearing. Vegetation is somewhat visually dominant.

Scenic Quality Rating Unit: Chuckwalla Valley

4. SCORE

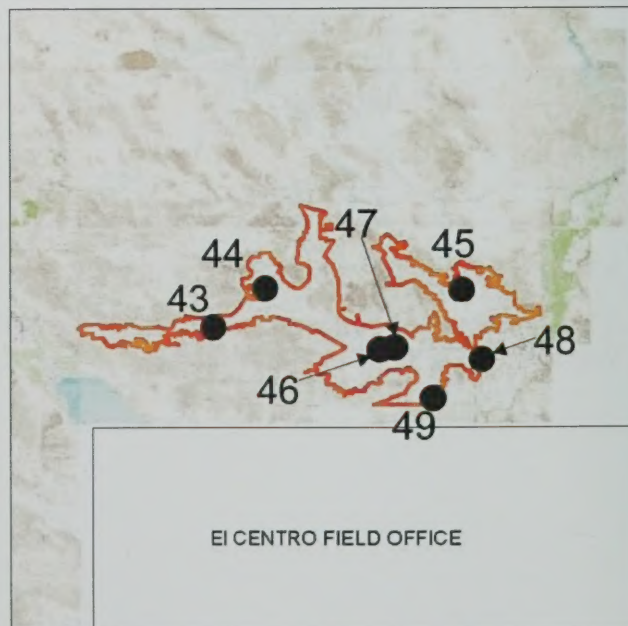
	Rating	EXPLANATION OR RATIONALE	SCENIC QUALITY CLASSIFICATION (check one)
a. Landform	1	Vast, low, gently rolling valley bottom	
b. Vegetation	3	Some variety of vegetation; one or two major types	
c. Water	0	None present	
d. Color	2	Subtle variation; some contrast in soil, vegetation	
e. Adjacent Scenery	4	Dramatic mountains surrounding area	☐ A – 19 or more ☒ B – 12 – 18 ☐ C – 11 or less
f. Scarcity	2	Fairly distinctive but not unusual	
g. Cultural Modification	0	Some cultural modification but overall natural-appearing	
TOTAL	12		

Comments:

The valley is a vast area, homogenous in terms of landform and vegetation with no line or break to suggest subdividing into smaller units. Adjacent scenery is dramatic from all IOPs.



SQRU Locator



• IOP Location

Appendix G.4

Visual Contrast Rating Data Sheets

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point
1 – Proposed Project

Location
JT Wilderness – lower elevation view at the northeast end of the Eagle Mountains and north end of Chuckwalla Valley, viewing south.

VRM Class
IV

Analyst
Michael Clayton

Date
October 13, 2011



CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular mountain ranges	Fairly even distribution with some patchiness	Linear form of aqueduct
Line	Horizontal to irregular	Curvilinear as defined by drainage and aqueduct to horizontal (valley floor)	Curvilinear
Color	Tan to bluish hues at distance	Tans and pale to golden yellow grasses, muted to medium greens for shrubs	Bluish (water)
Texture	Smooth to matte	Matte	Smooth

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Simple linear
Line	Same	Barely noticeable horizontal demarcation as defined by graded areas	Horizontal to vertical though barely discernible
Color	Same	Same	Light gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4					4		
Line	4					4				4		
Color	4				4					4		
Texture	4				4					4		

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long Level of Change: ☐ Very Low ☒ Low ☐ Moderate ☐ High

Does the Project Design Meet VRM Objectives? ☒ Yes ☐ No

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

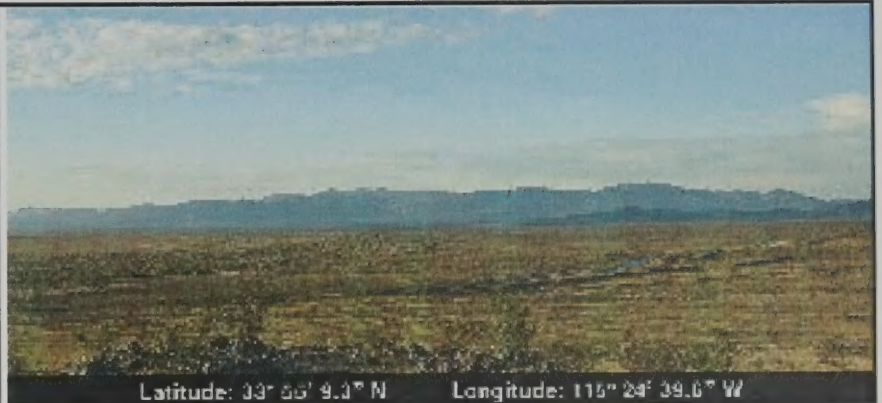
Key Observation Point
1A – Alternative 7

Location
JT Wilderness – lower elevation view at the northeast end of the Eagle Mountains and north end of Chuckwalla Valley, viewing south.

VRM Class
IV

Analyst
Michael Clayton

Date
January 16, 2012



Latitude: 33° 55' 9.0" N Longitude: 115° 24' 39.0" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular mountain ranges	Fairly even distribution with some patchiness	Linear form of aqueduct
Line	Horizontal to irregular	Curvilinear as defined by drainage and aqueduct to horizontal (valley floor)	Curvilinear
Color	Tan to bluish hues at distance	Tans and pale to golden yellow grasses, muted to medium greens for shrubs	Bluish (water)
Texture	Smooth to matte	Matte	Smooth

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Simple linear
Line	Same	Slightly noticeable horizontal demarcation due to grading/structures	Horizontal solar field and barely discernible vertical transmission structures
Color	Same	Same	Light blue to light and dark grays depending on panel orientation and sun angle
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4					4		
Line	4					4				4	4	
Color	4				4					4	4	
Texture	4				4					4		

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long Level of Change: ☐ Very Low ☒ Low ☐ Moderate ☐ High

Does the Project Design Meet VRM Objectives? ☒ Yes ☐ No

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point 2 – Proposed Solar Project	
Location JT Wilderness – higher elevation view along the western flank of the Coxcomb Mountains, viewing southwest over Chuckwalla Valley.	
VRM Class IV	
Analyst Michael Clayton	
Date January 16, 2012	Latitude: 33° 50' 57.1" N Longitude: 115° 20' 29.4" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to angular and irregular mountain ranges	Fairly even distribution with some linear patchiness defined by drainage	None readily apparent
Line	Horizontal to irregular and diagonal	Curvilinear as defined by drainage to horizontal as defined by valley floor	None readily apparent
Color	Tan to bluish hues at distance	Tans and pale to golden yellow grasses, muted to medium greens for shrubs	None readily apparent
Texture	Smooth to matte	Matte	None readily apparent

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Prominent geometric patterns and faintly noticeable verticals
Line	Same	Prominent horizontal to diagonal demarcations as defined by graded	Prominent horizontal to diagonal with barely discernible verticals
Color	Tan to bluish hues at distance with lighter tans of disturbed soils	Same	Light to medium gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4							4
Line	4						4				4	4
Color			4		4						4	
Texture	4				4					4		

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long	Level of Change: ☐ Very Low ☐ Low ☒ Moderate ☒ High
Does the Project Design Meet VRM Objectives? ☒ Yes ☐ No	

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point 3 – Proposed Solar Project

Location

Kaiser Road in the immediate project vicinity,
viewing east.

VRM Class

IV

Analyst

Michael Clayton

Date

October 26, 2011



Latitude: 33° 47' 43.9" N

Longitude: 115° 24' 03.7" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular mountain ranges	Patchy clumps to irregular and continuous at distance	None apparent
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal as defined by valley floor	None apparent
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	None apparent
Texture	Smooth to granular and coarse	Matte	None apparent

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Noticeable horizontal to diagonal lines of demarcation as defined by graded areas	Vertical and diagonal to prominent horizontal
Color	Same	Same	Light to dark gray to bluish hue depending on angle of view and weather conditions.
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4						4	4
Line	4						4				4	4
Color	4				4						4	
Texture	4				4						4	

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long Level of Change: ☐ Very Low ☐ Low ☒ Moderate ☒ High

Does the Project Design Meet VRM Objectives? ☒ Yes ☐ No

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point 3A – Alternative 7	
Location Kaiser Road in the immediate project vicinity, viewing northeast.	
VRM Class IV	
Analyst Michael Clayton	
Date March 23, 2012	Latitude: 33° 47' 43.15" N Longitude: 115° 24' 03.75" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular mountain ranges	Patchy clumps to irregular and continuous at distance	None apparent
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal as defined by valley floor	None apparent
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	None apparent
Texture	Smooth to granular and coarse	Matte	None apparent

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Noticeable horizontal to diagonal lines of demarcation as defined by graded areas	Vertical and diagonal to prominent horizontal
Color	Same	Same	Tan, medium to dark gray to black, to bluish hue depending on panel orientation/weather
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4						4	4
Line	4						4					4
Color	4				4						4	4
Texture	4				4						4	

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long	Level of Change: ☐ Very Low ☐ Low ☐ Moderate ☒ High
Does the Project Design Meet VRM Objectives? ☒ Yes ☐ No	

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point 4 – Proposed Project

Location

Near the western perimeter of the Desert Lily Sanctuary ACEC, just east of SR 177.

VRM Class

IV

Analyst

Michael Clayton

Date

October 26, 2011



Latitude: 33° 47' 26.3" N

Longitude: 115° 18' 21.4" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor to horizontal and slightly rounded to irregular mountains	Patchy clumps to irregular and continuous at distance	Simple linear
Line	Horizontal to irregular and angular	Irregular and indistinct to horizontal as defined by valley floor	Vertical
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	Dark brown
Texture	Smooth to granular and coarse	Matte	Smooth

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Indistinct simple linear of gen-tie transmission line
Line	Same	Same	Indistinct vertical
Color	Same	Same	Indistinct light gray
Texture	Same	Same	Indistinct smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4					4		
Line	4				4					4		
Color	4				4				4			
Texture	4				4				4			

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long

Level of Change: ☒ Very Low ☐ Low ☐ Moderate ☐ High

Does the Project Design Meet VRM Objectives?

☒ Yes ☐ No

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point 5 – Alternatives B and C	
Location Northbound Kaiser Road in the immediate vicinity of the Lake Tamarisk residential development.	
VRM Class IV	
Analyst Michael Clayton	
Date October 12, 2011	Latitude: 33° 44' 36.7" N Longitude: 115° 24' 02.3" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular and rounded mountains	Patchy to sequential clumps to irregular and continuous at distance	Linear road
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal and diagonal as defined by valley floor/road	Diagonal
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	Light gray
Texture	Smooth to granular and coarse	Matte	Smooth to matte

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Same	Prominent vertical and horizontal (poles) to curvilinear (conductors)
Color	Same	Same	Light to dark gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4							4
Line	4				4							4
Color	4				4						4	
Texture	4				4					4	4	

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long	Level of Change: ☐ Very Low ☐ Low ☐ Moderate ☒ High
Does the Project Design Meet VRM Objectives? ☒ Yes ☐ No	

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point 6 – Alternative D

Location

Eastbound I-10, approximately 0.8 mile west of the I-10 span, viewing to the northeast.

VRM Class

IV

Analyst

Michael Clayton

Date

October 26, 2011



Latitude: 33° 42' 13.1" N

Longitude: 115° 19' 36.7" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor to rugged angular background mountains	Patchy clumps to irregular and continuous at distance	Linear road
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal as defined by valley floor	Diagonal
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	Light gray
Texture	Smooth to granular and coarse	Matte	Smooth to matte

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Prominent horizontal to diagonal lines of demarcation as defined by graded areas	Prominent vertical (poles) to curvilinear (conductors)
Color	Same	Same	Light to dark gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4							4
Line	4						4					4
Color	4				4						4	
Texture	4				4					4	4	

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long Level of Change: ☐ Very Low ☐ Low ☐ Moderate ☒ High

Does the Project Design Meet VRM Objectives? ☒ Yes ☐ No

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point 7 – Alternative E	
Location Northbound SR 177, approximately 0.3 mile southwest of the span, viewing to the northeast.	
VRM Class IV	
Analyst Michael Clayton	
Date October 12, 2011	Latitude: 33° 45' 58.5" N Longitude: 115° 20' 14.1" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular and rounded mountains	Patchy to sequential clumps to irregular and continuous at distance	Linear road and utility poles
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal and diagonal as defined by valley floor/road	Diagonal to vertical
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	Light to medium gray (road), dark brown (poles)
Texture	Smooth to granular and coarse	Matte	Smooth to matte

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Same	Prominent vertical and horizontal (poles) to curvilinear (conductors)
Color	Same	Same	Light to dark gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4						4	4
Line	4						4				4	
Color	4				4						4	
Texture	4				4					4	4	

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long	Level of Change: ☐ Very Low ☐ Low ☒ Moderate ☒ High
Does the Project Design Meet VRM Objectives? ☒ Yes ☐ No	

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point

8 – Alternative E

Location

Westbound I-10, approximately 5.75 miles east of Desert Center, viewing north.

VRM Class

IV

Analyst

Michael Clayton

Date

October 13, 2011



Latitude: 33° 42' 1.65" N

Longitude: 115° 18' 13.32" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor, horizontal to angular mountains	Patchy clumps to irregular and continuous at distance	None apparent
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal as defined by valley floor	None apparent
Color	Tan to lavender and bluish hues at distance	Tans and muted to dark greens for shrubs	None apparent
Texture	Smooth to granular and coarse	Matte	None apparent

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Same	Prominent vertical (poles) to less distinct curvilinear (conductors)
Color	Same	Same	Light gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4						4	4
Line	4				4						4	4
Color	4				4					4	4	
Texture	4				4					4		

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long Level of Change: ☐ Very Low ☐ Low ☒ Moderate ☒ High

Does the Project Design Meet VRM Objectives? ☒ Yes ☐ No

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point 8A – Alternative 7

Location

Westbound I-10, approximately 5.75 miles east of Desert Center, viewing northwest.

VRM Class

IV

Analyst

Michael Clayton

Date

March 23, 2012



CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor, horizontal to angular mountains	Patchy clumps to irregular and continuous at distance	None apparent
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal as defined by valley floor	None apparent
Color	Tan to lavender and bluish hues at distance	Tans and muted to dark greens for shrubs	None apparent
Texture	Smooth to granular and coarse	Matte	None apparent

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Same	Prominent vertical (poles) and noticeable horizontal (solar field)
Color	Same	Same	Light to dark grays to bluish hew (solar arrays) depending on view angle/weather.
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4						4	4
Line	4				4						4	4
Color	4				4						4	
Texture	4				4					4		

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ Short ☒ Long Level of Change: ☐ Very Low ☐ Low ☒ Moderate ☒ High

Does the Project Design Meet VRM Objectives? ☒ Yes ☐ No

Appendix H

Traffic Impact Study

**TRAFFIC STUDY
FOR
Desert Harvest Solar Project**

Desert Center, California

Prepared for:

Aspen Environmental Group
235 Montgomery Street, Suite 935
San Francisco, CA 94104

Prepared by:

Hernandez, Kroone & Associates
234 East Drake Drive
San Bernardino, CA 92408

January 2012



I. Introduction

A. Purpose of the TIA and Study Objectives

This analysis was prepared to identify traffic impacts and, if needed, propose mitigation of impacts, due to the construction of the Desert Harvest Solar Project (Project) proposed by enXco Development Corporation (enXco or Applicant). The Project includes a solar farm producing up to 150 MW of electrical power and the transmission line to carry the power to the soon to be constructed Red Bluff Substation. The Project will be located north of Desert Center in the unincorporated area of Riverside County¹.

This traffic study was completed with generally accepted procedures and reflects the opinions of Hernandez, Kroone & Associates (HKA). The methods used were based on the Highway Capacity Manual. The traffic study follows the outline in the Riverside County Transportation Department "Traffic Impact Analysis Preparation Guide", dated April 2008.

Measure of Impacts - The existing condition and the future conditions without project traffic is the yardstick to determine the magnitude of the project and its traffic impacts. The operation of the traffic without the project is compared to the operation of the traffic with the project. The measure used to compare the operation of the intersections or roads is called Level of Service.

Level of Service (LOS) is a measure of the effectiveness of an intersection or road. It rates intersections by the length of delay or road segments by a volume to capacity ratio.

A LOS of A means that the intersection has little delay. A LOS of F means the intersection has delays of over a minute. The magnitude of change in the LOS when the project trips are added to the intersection indicates the magnitude of the project's impact.

The LOS measure of effectiveness for a road is based on the ratio of the volume of traffic using the road segments to the capacity of the road segments. The traffic on a road operating at LOS A would move freely. The traffic on a road operating at LOS F would be traveling significantly less than the posted speed limit in stop / go congestions.

Appendix A has tables showing the ranges of delay for intersections and the volume to capacity (v/c) ratios for road segments for the various LOS categories.

In the County of Riverside, if the LOS decreases to below an LOS of C with the addition of the traffic generated by the proposed project (project traffic), it is considered to have an impact and mitigation may be required. Intersections under joint jurisdiction with Caltrans may operate at an LOS of E.

Intersections or road segments are selected for analysis based on the project traffic distribution anticipated. The study intersections were analyzed for delay and level of service (LOS) using HCS on the unsignalized intersections. The HCS software uses the Highway Capacity Manual 2000 methodology (HCM) for solving for LOS and delay.

The HCM analysis procedures include mathematically applied adjustment factors as part of the process in calculating the final LOS rating of an intersection. One of these adjustment factors is called the peak hour factor (PHF). This helps factor in the differences between an hourly volume and variations in minute increments within an hour. The PHF is defined by the *Highway Capacity Manual* as "...the ratio of total hourly volume to the peak rate of flow within the hour..." The traffic volume is divided by the PHF to adjust it to the maximum flow through the intersection.

HKA would like to acknowledge enXco Development Corporation and Aspen Environmental Group who provided several of the attached figures.

B. Site Location and Study Area (See Figure 1, AKA Draft Administrative EIS Figure 2-1)

The Project will be located near Desert Center, California, in the eastern portion of Riverside County, near the Joshua Tree National Park. The nearest communities are Eagle Mountain, Lake Tamarisk, and Desert Center. The solar panels will be constructed and operated at the "solar farm", approximately 5 miles north of Interstate 10 (I-10) along Kaiser Road. The Bureau of Land Management (BLM) administers the majority of the land in the area.

The State Route 177 / I-10 interchange is the nearest interchange. The interchange is approximately 50 miles east of Indio, California and 50 miles west of Blythe, California.

C. Development Project Identification - Riverside County Case Number and Related Cases

Not Applicable

D. Development Project Description

1) Project Size and Description (See Figure 2, AKA Draft Administrative EIS Figure 2-2)

The several alternatives to the projects are listed in Table 1.

Table 1: Desert Harvest Solar Project Alternatives

Alternative:	Brief Description:
1	No Action (No Plan Amendment)
2	No Development Action (with Plan amendment)
3	Proposed Solar Project – 150 MW Facility
4	Solar Project Excluding Palen-Ford Wildlife Habitat Management Area
5	Reduced Footprint Solar Project
A	No Gen-Tie
B	Proposed Gen-Tie (Shared Towers)
C	Separate Transmission Towers within same Right-of-Way
D	Cross-Valley Alignment for Gen-Tie
E	New Cross-Valley Alignment for Gen-Tie

This traffic study analyzed the traffic impacts of Alternative 3 Proposed Solar Project. This alternative is the most likely to be completed. It is also the largest acreage of solar facilities and will require the largest construction crew and probably create the most traffic impacts.

In order to demonstrate the traffic impacts of Alternative 3, traffic impacts of the existing or "No Action" Alternative will be developed. The difference in the traffic impacts between the "No Action" and "Proposed Solar Project" alternatives are the traffic impacts due to the project.

The components of Alternative 3 Proposed Solar Project are as described as: "... a 150 MW nominal capacity, alternating current (AC) solar photovoltaic (PV) energy-generating project. The project would consist of a main generation area, operations and maintenance (O&M) facility (either on or off site), on-site substation, switchyard, and site security. The project would be located on lands administered by the BLM, Palm Springs-South Coast Field Office in Riverside County, approximately 5 miles north of Desert Center. The project would be located on 1,208 acres, and would be comprised of two separate parcels separated by a desert wash. The northern parcel consists of 1,053 acres and the southern parcel consists of 155 acres."ⁱⁱⁱ

Construction facilities will include PV arrays, switchyard, inverters, overhead lines, access corridors (maintenance roads), and on-site substation. The O&M facility may be built on site or it may be a remodel facility that is within 10 miles of the solar project. Site security includes a guard building, fencing and lighting.

The solar project will have little manpower requirements once it is constructed and connected. The O&M Facility will be manned during operation of the Project. The guard shack will be manned 24 hours a day during the construction and operation of the Solar Farm.

It is anticipated that approximately 10 people will arrive and leave the site daily for operation and maintenance. The majority of the staff will be at the site during daylight hours but occasionally testing or maintenance work will require night work.

It is assumed that 10 people will arrive and leave the site daily for guard duty. Their shifts are assumed to be 12 hours long, with 5 working each shift.

Analysis of the traffic impacts of the Gen-tie Line Alternatives was not part of this traffic study. The following paragraph is being included as information.

A transmission line (Gen-Tie Line) will be needed to transport the power generated by the Desert Harvest Solar Project to the Red Bluff Substation near the I-10. There are several alternatives for the routing of this above ground transmission line. Four alternatives are proposed and shown on exhibits in Appendix A. Two of the alternatives will use the same right-of-way that will be used by the Desert Sunlight Solar Farm. Alternative B has the two solar facilities sharing the same towers.

The Red Bluff Substation was not part of the Desert Harvest Solar Project. Its traffic impacts were not analyzed in this traffic study, but it is being built in this area. The following paragraph is included for information.

The Red Bluff Substation is being construction by Southern California Edison (SCE) near the I-10. It will connect the Gen-Tie transmission line from the Desert Sunlight Solar Farm and the Desert Harvest Solar Project to the existing Devers-Palo Verde (DSPV) transmission line. Its components include:

- Red Bluff Substation: 500/220 kV substation on approximately 90 acres
- Transmission Lines: Approximately 2,000 feet of new transmission lines (two lines of approximately 1,000 feet each), to connect to the existing DSPV transmission line
- Generation Tie Line Connection: Connect the TRANSMISSION LINE to the Red Bluff Substation
- Modification of existing 220 kV structures
- Distribution Line for Substation Light and Power: Approximately 300 feet of 12 kV overhead distribution line and approximately 1,000 feet of underground distribution line (to provide substation light and power)
- Telecommunications Facilities: Install optical ground wire (OPGW) on the DSPV interconnection generation tie-line

2) Existing Land Use and Zoning

The Project will be located on land within the BLM's charge. The land use is open space. The Desert Center Area Land Use map from the County of Riverside General Plan is included in Appendix A.

3) Proposed Land Use and Zoning

No zoning changes are proposed by the Project's Plan of Development (POD). Renewable energy generation or transmission facilities are not expressly allowed nor prohibited under the zoning ordinances but permitting may be required by County of Riverside for the use of private property in this manner.

The Project component will require buildings, fencing and arrays on approximately 1,200 acres of BLM land.

4) Site Plan of Proposed Project (reduced) Figure 2

5) Proposed Project Opening Year – 2014

6) Any Proposed Project Phasing – No project phasing is planned but the construction work will be so that limited areas of soil will be disturbed at a time.

7) Indicate if Project is within a City Sphere of Influence –

The project is not within the sphere of influence of any city.

II. Area Conditions

A. Identify Study Area and Intersections (Figures 3 and 4)

Access to the Project is provided by Kaiser Road, a major road with 118 feet of right of way. It is predominately a north-south paved road that ends at State Route 177 (SR-177) at the south and at Eagle Mountain Landfill at the north end. It is one lane in each direction. It is mostly traveled by local residents. During a two hour period on a typical weekday, HKA observed three vehicles on the road north of its intersection with SR-177.

SR-177 is predominantly a north-south road that provides access for Kaiser Road from the I-10. According to the Desert Center Area Plan by the County of Riverside, it is a Mountain Arterial with 110 feet of right of way.ⁱⁱⁱ It connects I-10 to SR 62, another east-west route in eastern Riverside County, approximately 30 miles north of Desert Center. SR-177 is one lane in each direction with centerline and edge of pavement markings.

The I-10 is an east-west interstate starting in Santa Monica, CA and ending in Florida. At this location it is two lanes in each direction.

There is an east-west road named Ragsdale Road between the I-10 and the SR-177 / Kaiser Road intersection that was not studied or counted. At the time the background counts were taken, the road appeared be a frontage road between the Eagle Mountain / I-10 interchange and the SR-177 / I-10 interchange. It dead ends east of the SR-177.

Intersections were selected based on project trips, proposed distribution and the anticipated use of the SR-177 interchange to reach the Project site.

Intersections to be analyzed are:

- SR-177 / I-10 EB Ramp
- SR-177 / I-10 WB Ramp
- SR-177 / Kaiser Road

B. Existing Traffic Controls and Intersection Geometrics (Figure 5)

SR-177 is the main road and is not stop controlled. The intersecting roads with SR-177 are stop controlled. The geometrics of the intersections are shown in Figure 5 and in Table 2.

Table 2: Existing Geometrics

Intersections	NB			SB			EB			WB		
	L	T	R	L	T	R	L	T	R	L	T	R
SR-177 / I-10 EB Ramp	-	1	S	S	1	-	1	1	Y	-	-	-
SR-177 / I-10 WB Ramp	S	1	-	-	1	S	-	-		S	1	S
SR-177 / Kaiser Road	S	1	-	-	1	S	S	-	S	-	-	-

S – Turning Movement is shared with adjacent movement.

Y – Turning movement must yield but is not stopped controlled. Has a separate lane.

C. Existing Traffic Volumes - AM and PM Peak Hour Turning Movements and Roadway Links) (Figure 6A - AM and Figure 6B - PM)

Turning movement counts and a 24 hour classification count were taken by Counts Unlimited (See Appendix B) on November 22, 2011. Only 119 vehicles used Kaiser Road north of Lake Tamarisk Resort during the 24 hour period counted.

The volumes shown on Figures 6A and 6B are in passenger car equivalents (PCEs). Large trucks move through surface streets and intersections more slowly than cars and take more time to move through intersections. Since the analysis procedures are based on the number of passenger cars, the trucks must be converted to an equivalent number of cars. The existing truck trips were converted to passenger car equivalents (PCEs) by using the following factors:

<u>Classification</u>	<u>Passenger Car Equivalents</u>
Cars	1
Large 2-axle Vehicles	1.5
3-axle Vehicles	2
4 or more axle Vehicles	3

The calculations of the PCEs are included in Appendix B.

Data on the volume of the I-10 in the project area was obtained from the Caltrans 2010 Annual Average Day Traffic Data (Appendix A). The peak hour volume on the I-10 near the SR-177 interchange is in the 2,500 to 2,700 range.

D. Existing Delay and Level of Service (LOS) at Study Intersections / Roadway Links

Using the existing peak hour volumes and geometrics, the following LOS resulted at the study intersections. The detailed printouts are in Appendix C.

Table 3: LOS Summary for Existing Conditions and Traffic Volumes

Intersection	Control	AM Peak Period		PM Peak Period	
		Delay, sec	LOS	Delay, sec	LOS
SR-177 / I-10 EB	EB Off Ramp Stops	9.0	A	9.3	A
SR-177 / I-10 WB	WB Off Ramp Stops	9.1	A	9.7	A
SR-177 / Kaiser RD	SB Kaiser RD Stops	8.5	A	8.8	A

Since SR-177 is not controlled, traffic movements on SR-177 will maintain an LOS A. The movements of concern are those at the stop-controlled approach, as they must yield to the traffic on SR-177. Furthermore adequate gaps in the traffic stream or queues need to be available to left and right turning vehicles as shown above. The existing traffic volumes operate at an acceptable LOS in both the AM and PM Peak Periods.

E. Provide Copy of General Plan Circulation Element in the Project Vicinity (Figure 7)

F. Indicate if Transit Service is Available in the Area and Along which Routes (Appendix A)

There is no public transportation along SR-177. Greyhound Bus Service and perhaps other commercial bus lines travel east and west along I-10 without designated stations at SR-177.

III. Projected Future Traffic

A. Project Traffic and Project Phasing (each study year)

1) Ambient Growth Rate

The desert cities of the County of Riverside experienced rapid growth in the recent boom period. Table 4 shows the growth of the two nearest cities based on numbers from the U.S Census Bureau website.

Table 4: Population Growth at I-10 Communities

City	Population			
	1990	2000	2009	Growth Rate, %
Blythe, CA	8,448	20,465	21,329	152
Indio, CA	36,850	49,116	82,230	123

The I-10 communities in the area have shown an approximately 135% growth rate over that 19 year span. However the unincorporated areas have not grown as rapidly. Table 5 shows rates of growth of about 45% over the same period in the unincorporated areas.

Table 5: Population Growth in Unincorporated County of Riverside

	Population			
	1990	2000	2009	Growth Rate, %
Balance of County	385,384	420,721	558,214	45

Caltrans provides a history of annual average daily traffic counts at interchanges throughout the state. The difference between volume of traffic west of the interchange and the volume of traffic east of the interchange is the net traffic exiting and entering at the interchange. An increase in traffic indicates an increase in the population or employment activity near that location.

Comparing the net traffic, the difference in the traffic on either side of the interchange as an indication of the traffic accessing the Desert Center area, shows a slower rate of growth. During the 1998 – 2008 time period, the growth in net traffic at the SR-177 ramp was 14%, an average rate of about 1.5% per year in net change. This is probably a more accurate number for the anticipated growth in the area. For the purposes of this analysis, a 3% total growth in the

background traffic during the construction period was used. That would be an annual growth rate of 1.5% over a 2 year period.

Table 6: Caltrans Annual Average Daily Traffic Counts at SR-177 / I-10 Interchange

1998			2008			Growth Rate of Net Traffic, %
West of Interchange	East of Interchange	Net Traffic	West of Interchange	East of Interchange	Net Traffic	
15,100	13,700	1,400	23,000	21,400	1,600	14

2) Project Trip Generation

Project trips are the volume of traffic that will be added to the road system because of the development of the project. Since this land is currently undeveloped, all trips that will be generated by the project are considered to be project trips for the purposes of this study.

There are several ways to estimate the trips generated by a project. One way is to use data collected from a large number of similar projects. Such data has been compiled by the Institute of Transportation Engineers, "ITE Trip Generation Handbook." These data points have been plotted and best fit curves through these data points have been developed. However, the construction of a solar farm, substation, and transmission lines or the operation of these facilities is not identified in the ITE Trip Generation Handbook.

Therefore, an analysis of individual site activities including employment, deliveries of construction materials and equipment, the construction schedule, and future operational activities and resulting trips needs to be studied individually to identify the trips generated at varying phases of project development.

Furthermore, these trips need to be identified as to those trips occurring during the hours of expected peak traffic on the road. Generally there are two times when the existing traffic volume is highest: between 0600-0900 and 1600-1800 on a normal week day. The impacts of the traffic are studied for the peak one hour period during each of those two periods. The discussion that follows describes how the estimate the project trips of concern for both the AM and PM Peak Periods was generated.

Opening Day Project Trips - The project trips for the operation and maintenance of the Desert Harvest Solar Project will be low.

Given an Operation and Maintenance staff of 10 per shift, it is anticipated approximately 1 round trip by each will be made to the project site. About 5 delivery trips per weekday are anticipated. Table 7 shows an anticipated schedule of the trips to and from the site each day.

Table 7: Operation and Maintenance Project Trips

Buildings	Staff per shift	Shifts	ADT Trips (one-way)	AM Peak Period		PM Peak Period	
				IN	OUT	IN	OUT
O&M, etc.	10	0600 – 1800	20	-	-	-	-
	10	1800 – 0600	20		10	10	-
Guard Shack	5	0600 – 1800	10	-	-	-	-
	5	1800 – 0600	10	-	5	5	-
Deliveries		0800 – 1700	10	1	1	1	1
Total			70	1	16	16	1

This results in total Opening Day project trips of 17 trips during the AM and PM Peak Periods. An increase of 17 trips during the peak hour does not impact the intersections or roadway. The existing intersections and roadways have sufficient capacity to absorb these 17 trips without a decrease in LOS or operation. There is no concern for impacts to the study roads or intersection and no need for mitigation due to the operation and maintenance project trips for the Project.

A future analysis (20 year scenario) with these 17 trips was not performed. The project trips are not anticipated to change since the activity which generated the trips is not likely to change. The future background intersection volumes will increase based upon growth rates established earlier. However traffic forecasting for a 20 year scenario is not an exact science. The volumes forecasted will have a variance of more than these 17 project trips. Therefore, a future LOS was not performed.

Additionally the Riverside County Transportation Department Traffic Impact Analysis Preparation Guide does not require the analysis of intersections that receive less than 50 Peak Period project trips. The Project does not generate at least 50 Peak Period project trips during the operation and maintenance of its components after construction. The Project will generate at least 50 Peak Period project trips during the construction of its components. Construction traffic impacts will be analyzed.

Construction Traffic Project Trips- Frequently the impacts of the project trips during construction are ignored due to the limited duration and temporary nature of the impacts. The construction period of this project is expected to take from 2012 through 2014 or a little over 2 years. The number of project trips identified for Opening Day and the 20 year future scenario are too low to be significant. Therefore, the project trips from the construction activities were selected for impact analysis.

Construction Worker Project Trips –

Solar Project – The construction and management workers required are expected to peak at about 250 employees. Construction workers are expected

to be on site between 0700 – 1900. The hours may be adjusted for particular construction efforts (concrete pours) or to avoid the worst of the summer heat.

The project trips for the construction workers are shown in the following table. The calculations and assumptions leading to this table are given in more detail in Appendix B.

Table 8: Project Trips during Construction

Component	Daily Trips, PCEs	AM Peak Period		PM Peak Period	
		IN	OUT	IN	OUT
Solar Project	426	125	0	-	125
Guard Crew	20	0	5	-	0
Total	446	125	5	-	125

Construction Equipment Project Trips - The “Desert Harvest Solar Project Draft EIS and CDCA Plan Amendment”, by Aspen Environmental Group November 2011 provided a great deal of information regarding quantities and types of vehicles that will be used for the construction of the Project and the materials that will be hauled to the construction site. It is anticipated that approximately 600 loads will be brought to the site over the course of the construction effort. The majority of the equipment and materials will be brought to the site via oversized vehicles.

Since access to the site requires driving the oversized vehicles on state controlled roads (I-10, SR-177, etc), permits from Caltrans are required. Those permits require the oversized vehicles to access the State’s roads outside of the peak traffic periods.

The equipment will be brought to the site as needed and will not impact the public roads again until they depart. Most of this equipment will be brought to the site prior to the maximum level in construction worker traffic.

It is anticipated that an average of about 20 large vehicles will deliver equipment or material each day. Even though there may be several deliveries of materials a day for most of the construction period, most of these vehicles are not expected to move during the peak traffic periods. The only exception to this norm will be when concrete is being poured.

A concrete batch plant may be set up on site but if not concrete will be delivered in 10 cubic yard mixers to the project site from communities to the east. These vehicles have 3 axles on the road and move during all hours of the day.

Since concrete needs to be poured in cooler temperatures, the concrete trucks frequently move during the AM Peak Period. When the pouring sites are set up efficiently, up to 3 mixers can arrive, be unloaded and leave in an hour. For the purposes of this analysis, it is assumed that concrete is being poured in two sites at one time and that 6 mixers will arrive at the site and 5 mixers will leave the site in an hour’s time during the AM Peak Period.

For the concrete to be unloaded effectively, the site needs to be set up and ready to go. This normally means that part of the construction crew has arrived earlier to set up the site. Approximately 10% of the workers were estimated to arrive earlier to set up the site.

Large trucks move through surface streets and intersections more slowly than cars and take more time to move through intersections. Since the analysis procedures are based on the number of passenger cars, the concrete mixer must be converted to an equivalent number of cars. The project truck trips were converted to passenger car equivalents (PCEs) by using a factor of 3. Using a PCE of 3 per concrete mixer, the number of project trips due to concrete mixers is 18 PCEs arriving and 15 PCEs leaving the AM Peak Period.

Concrete will not be poured during all peak traffic periods during the construction. But since the deliveries of large loads that are not oversized could happen during the peak periods, the inclusion of almost a third of the daily deliveries during the AM Peak Period results in a conservative estimate for the analysis.

Table 9: Construction Project Trips, PCEs

Component	Daily Trips, PCEs	AM Peak Period		PM Peak Period	
		IN	OUT	IN	OUT
Solar Project	426	125	0	0	125
Guards	20	0	5	0	0
Personnel Subtotal	446	125	5	0	125
Deliveries, Concrete, Equipment	Varies	18	15	0	0
Total	-	143	20	0	125

3) Project Trip Distribution and Assignment (Figures 8 and 9)

Access to the site will be primarily from I-10 via SR-177 and Kaiser Road. The majority of the construction workers will be assigned to the SOLAR FARM off Kaiser Road.

Construction Workers Distribution – The construction workers will access the site via the SR-177 / I-10 interchange. Those working at the Project will turn north at the interchange and travel on SR-177 to Kaiser Road to the site.

Given the low population density in the area it was assumed that only about 6% of the workers would come from the local area. The distribution assigned half of them as arriving from Eagle Mountain, a community north of the Project site and the other half arriving from the northeast using SR-177.

The remainder of the employees was distributed to arrive via I-10. The population centers, with available workers, are primarily west of the SR-177 / I-10 interchange. Due to the difference in population densities, the remaining

construction worker traffic was divided approximately 70% - 30% west and east of the interchange.

Concrete Trucks – The project distribution has all concrete trucks arriving and leaving to the east from Blythe. A plant may be set up on site but concrete deliveries were included for this analysis.

Figure 8 shows the inbound project trip distribution in terms of percentage. The outbound distribution of project trips would be the opposite of the inbound distribution. Figure 9 shows the project trips distribution in terms of PCEs.

4) Other Factors Affecting Trip Generation (identify any factors used to adjust trip generation, such as pass-by trips, internal trips, or modal choice.

The Project is a destination that does not lend itself to pass-by trips, internal trips, or modal choice.

5) Construction Project Peak Hour Turning Movement Traffic

See Figures 8 and 9 discussed above.

6) Project Completion or Phase Completion Traffic Volumes

See Section III. A. 2. The construction worker traffic exceeds traffic generated by operation and maintenance activities and as such is the only traffic that needs to be considered in this traffic study.

C. Cumulative Traffic (background)

1) Ambient Growth Rate

See section III.A.1.

2) Identify Location of Other Approved or Proposed Development Projects

Cumulative traffic impacts are a concern when new projects have been approved, are funded for construction, but are currently not opened. In the near future, these projects would generate additional traffic trips throughout the study area. At the time of the data collection for existing traffic volumes, these cumulative project trips cannot be collected and must be estimated.

The Riverside County staff was contacted for the names and status of projects in the area. At this time none were identified that would use the intersections other than the Desert Sunlight Solar Farm and the Red Bluff Substation. The Farm and the Red Bluff Substation are under construction but are not contributing large numbers of vehicles on the road at this time.

3) Trip generation from Other Approved Projects – The Desert Sunlight Solar Farm is under construction. The Desert Sunlight Solar Farm Transmission line will soon be under construction. The Red Bluff Substation is or will be under construction soon. The counts taken in November did not show a high level of construction traffic at the time.

The highest months of construction traffic for the Desert Sunlight Solar Farm were anticipated to be the 5th and 6th months of construction. That period will be over before the Desert Harvest Solar Project begins construction.

To conservatively account for the construction traffic generated by the Desert Sunlight Solar Farm Project, half of its projected traffic for the Farm construction, the transmission line and Red Bluff Substation construction trips were included. Trips were included in the construction year scenario. The trip estimates and distribution for Desert Sunlight Farm Project are shown in Table 10 and diagramed on Figure 11. Details of how the Desert Sunlight Solar Farm project trips were developed are in Appendix B.^{iv}

*Table 10: Desert Sunlight Solar Farm
Construction Project Trips, PCEs*

Component	Daily Trips, PCEs	AM Peak Period		PM Peak Period	
		IN	OUT	IN	OUT
SOLAR FARM & TRANSMISSION LINE	204	88	2	-	10
RED BLUFF SUBSTATION	108	46	-	-	8
Visitors, etc.	10	-	-	-	-
Personnel Subtotal	322	134	2	-	18
Deliveries, Concrete, Equipment	-	18	15	-	-
Total	-	152	17	-	18

4) Trip Distribution and Assignment of Other Approved Development Projects - Not Applicable.

5) Total Background Peak Hour Turning Movement Volumes (Figures 10A and 10B)

The background traffic counted at the site was increased by 3% to project the background traffic expected during the construction period. To conservatively account for the construction traffic generated by the Desert Sunlight Solar Farm

Project, half of its projected traffic for the Farm construction, the transmission line and Red Bluff Substation construction trips were included.

IV. Traffic Analysis

A. Capacity, Level of Service and Improvement Analysis - Intersections

1) Delay and LOS for Existing Conditions

See Section II. D. LOS printouts are in Appendix C.

Table 11: LOS Summary for Existing Conditions and Traffic Volumes

Intersection	Control	AM Peak Period		PM Peak Period	
		Delay, sec	LOS	Delay, sec	LOS
SR-177 / I-10 EB	EB Off Ramp Stops	9.0	A	9.3	A
SR-177 / I-10 WB	WB Off Ramp Stops	9.1	A	9.7	A
SR-177 / Kaiser RD	SB Kaiser RD Stops	8.5	A	8.8	A

2) Delay and LOS for Project Conditions

For this project, the only activity which generates a traffic concern is the construction work. Normally construction impacts are not of concern as they are of short duration and temporary. Typically, the project trips are added to the opening day and future year scenario background traffic and it is the combination of those two volumes which generate a traffic impact. However, in this situation the existing ADT of the streets is in the 100 ADT range. The project trips added by the Project for Opening Day don't generate enough traffic volume warranting an evaluation or creating an impact.

In this situation the construction period will continue for more than 2 years and the number of vehicles used during construction will be substantially more than the anticipated volumes of traffic during the operation and maintenance of the Project. The construction traffic impacts were analyzed. More detailed LOS analysis printouts can be found in Appendix C.

Table 12: LOS Summary for Construction Period

Intersection	Control	Without Project		With Project	
AM Peak Period		Delay, sec	LOS	Delay, sec	LOS
SR-177 / I-10 EB	EB Off Ramp Stops	9.1	A	10.0	B
SR-177 / I-10 WB	WB Off Ramp Stops	9.1	A	9.9	A
SR-177 / Kaiser RD	SB Kaiser RD Stops	8.5	A	8.6	A

Intersection	Control	Without Project		With Project	
PM Peak Period		Delay, sec	LOS	Delay, sec	LOS
SR-177 / I-10 EB	EB Off Ramp Stops	9.3	A	9.8	A
SR-177 / I-10 WB	WB Off Ramp Stops	9.7	A	10.1	B
SR-177 / Kaiser RD	SB Kaiser RD Stops	8.8	A	9.6	A

To summarize the information in Table 12, the impact of the construction traffic to the background traffic expected during the construction period increased the delay at all intersections by less than one second. The construction traffic for this Project had no significant traffic impact at the intersections.

3) Delay and LOS under Cumulative Conditions

The construction period for both the Desert Sunlight Solar Farm and the Desert Harvest Solar Project will overlap. To conservatively account for the construction traffic generated by the Desert Sunlight Solar Farm Project, half of its projected traffic for the Farm construction, the transmission line and Red Bluff Substation construction trips were included as cumulative trips. The LOS of the anticipated background traffic and the Desert Sunlight Solar Farm Project and the Project traffic are included in Table 13. More detailed LOS analysis printouts can be found in Appendix C.

Table 13: LOS Summary for Cumulative Conditions

Intersection	Control	Without Project		With Project	
AM Peak Period		Delay, sec	LOS	Delay, sec	LOS
SR-177 / I-10 EB	EB Off Ramp Stops	9.4	A	10.6	B
SR-177 / I-10 WB	WB Off Ramp Stops	9.4	A	10.5	B
SR-177 / Kaiser RD	SB Kaiser RD Stops	8.6	A	8.7	A
PM Peak Period		Delay, sec	LOS	Delay, sec	LOS
SR-177 / I-10 EB	EB Off Ramp Stops	9.3	A	9.9	A
SR-177 / I-10 WB	WB Off Ramp Stops	9.7	A	10.1	B
SR-177 / Kaiser RD	SB Kaiser RD Stops	8.8	A	9.6	A

To summarize the information in Table 13, the impact of the construction traffic plus the anticipated background traffic and cumulative traffic volumes expected during the construction period increased the delay at all intersections by less than two seconds. The LOS did not deteriorate at the intersection of SR 177 / Kaiser Road. The LOS was lowered at the other intersections, but the impact was negligible.

The construction traffic for this Project had no significant traffic impact at the intersections.

V. Findings and Recommendations

A. Traffic Impacts and Level of Service Analysis

This analysis was prepared to identify traffic impacts and, if needed, propose mitigation of impacts, due to the construction of the Desert Harvest Solar Project (Project) proposed by enXco Development Corporation (enXco or Applicant). The Project includes a solar farm producing up to 150 MW of electrical power and the transmission line to carry the power to the soon to be constructed Red Bluff Substation. The Project will be located north of Desert Center in the unincorporated area of Riverside County^v.

This traffic study was completed with generally accepted procedures and reflects the opinions of Hernandez, Kroone & Associates (HKA). The methods used are based on the Highway Capacity Manual. The traffic study follows the outline in the Riverside County Transportation Department "Traffic Impact Analysis Preparation Guide", dated April 2008.

The project trips were generated and distributed. The Project will generate less than 20 trips per peak traffic period after construction is completed. As analysis is not required at intersections with less than 50 peak hour trips, an Opening Day and Future Year (20 year scenario) was not completed.

However due to the length of the construction period, the construction traffic impacts were evaluated. Based on the construction trips and the distribution of those trips the following intersections were selected for analysis:

- SR-177 / I-10 EB Ramp
- SR-177 / I-10 WB Ramp
- SR-177 / Kaiser Road

As noted before, the future conditions without project traffic is the yardstick to determine the magnitude of the project and its traffic impacts. The operation of the traffic without the project is compared to the operation of the traffic with the project to identify the traffic impacts. The measure of the operation of the traffic is called the Level of Service (LOS).

The study intersections were analyzed for the AM and PM peak traffic periods for the **without** project condition and the **with** project condition during the construction period. Counts were taken at these intersections, those volumes were increased by 3% to account for the increase in background traffic over the next two years to model the without project condition. The project trips were added to model the **with** project condition.

The Highway Capacity Software was used to calculate the LOS. Table 11 is a summary of the current operation of the intersections. All intersections currently operate at a LOS of A.

Table 12 summarizes the operation of the intersections during the construction time period.

Table 13 summarizes the operation of the intersection during the construction time period with the addition of the cumulative traffic volumes. Under these conditions the delay at all intersections increased by less than two seconds. The LOS did not deteriorate at the intersection of SR 177 / Kaiser Road. The LOS was lowered at the other intersections but it did not show a significant impact. The construction traffic for this Project had no significant traffic impact at the intersections.

The Project has no traffic impacts at the study intersections and no mitigation is required.

The construction traffic will add a number of large vehicles to the local roads. Being a "good neighbor" during construction might include the following efforts:

- Sweeping the paved roads periodically to cut down on dust picked up by the construction vehicles
- Documenting the current state of the roads (video and pavement coring) to be used during construction and returning the roads to the current level after construction.

B. Traffic Signal Warrant Analysis

No traffic signal warrant analysis is needed.

C. Circulation requirements

No on-site or area wide circulation improvements are needed.

Figure 1 – Aspen Environmental Group Figure 2-1 Project Overview (Vicinity Map)
Figure 2 – Aspen Environmental Group Figure 2-2 Alternative 3 Proposed Solar Project
Figure 3 – Photos of Intersections
Figure 4 – Photos of Intersections
Figure 5 – Existing Lane Configurations
Figure 6A – AM Existing Traffic in PCEs
Figure 6B – PM Existing Traffic in PCEs
Figure 7 – General Plan Circulation Element
Figure 8 - Project Trip Distribution, %
Figure 9 - Project Trip Distribution, PCEs
Figure 10A – AM Background Traffic Adjusted for Construction Period w/o Project
Figure 10B – PM Background Traffic Adjusted for Construction Period w/o Project
Figure 11 – Desert Sunlight Solar Farm Project Trips
Figure 12A – AM Background with Cumulative Traffic Volumes, in PCEs
Figure 12B – PM Background with Cumulative Traffic Volumes, in PCEs

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- ⁱ Aspen Environmental Group, "Desert Harvest Solar Project Draft EIS and CDCA Plan Amendment", November 2011, page 2-1.
- ⁱⁱ Aspen Environmental Group, "Desert Harvest Solar Project Draft EIS and CDCA Plan Amendment", November 2011, page 2-4 and page 2-5.
- ⁱⁱⁱ Riverside County Integrated Project, Desert Center Area Plan Circulation, Figure 6.
- ^{iv} Hernandez, Kroone & Associates, Traffic Study for "Desert Sunlight Solar Farm", June 2010.
- ^v Aspen Environmental Group, "Desert Harvest Solar Project Draft EIS and CDCA Plan Amendment", November 2011, page 2-1.

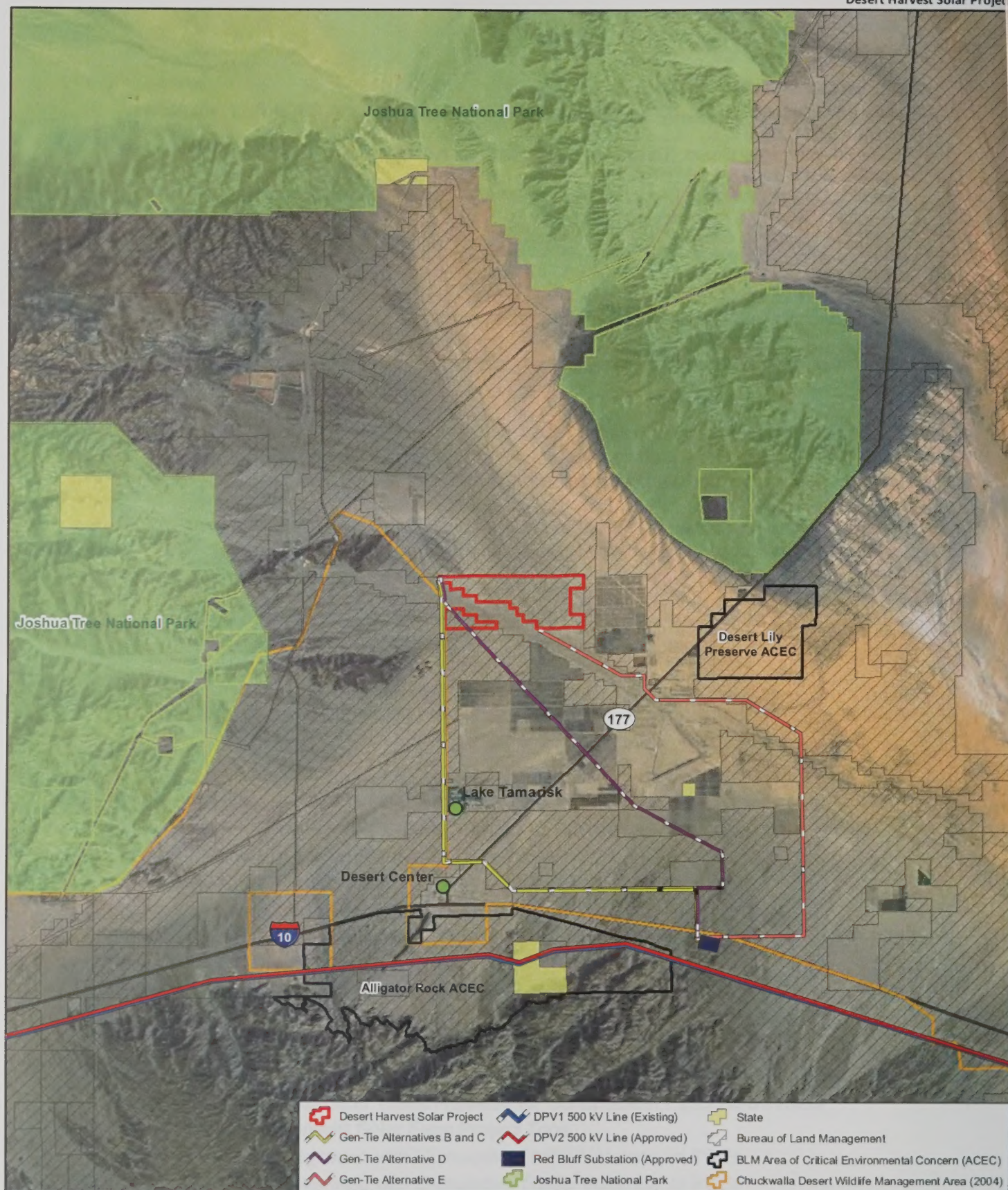


Figure 2-1

Project Overview

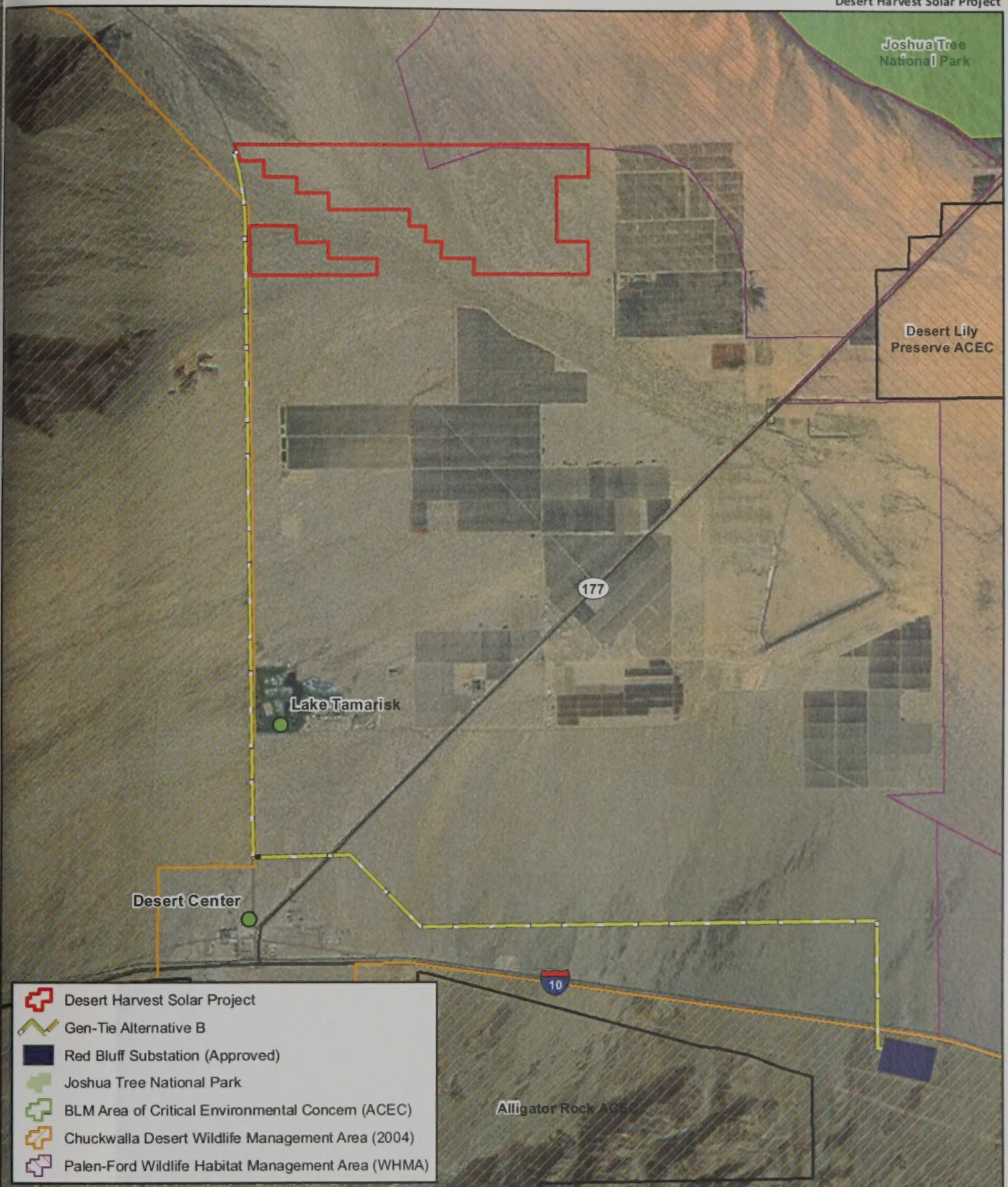


Figure 2-2

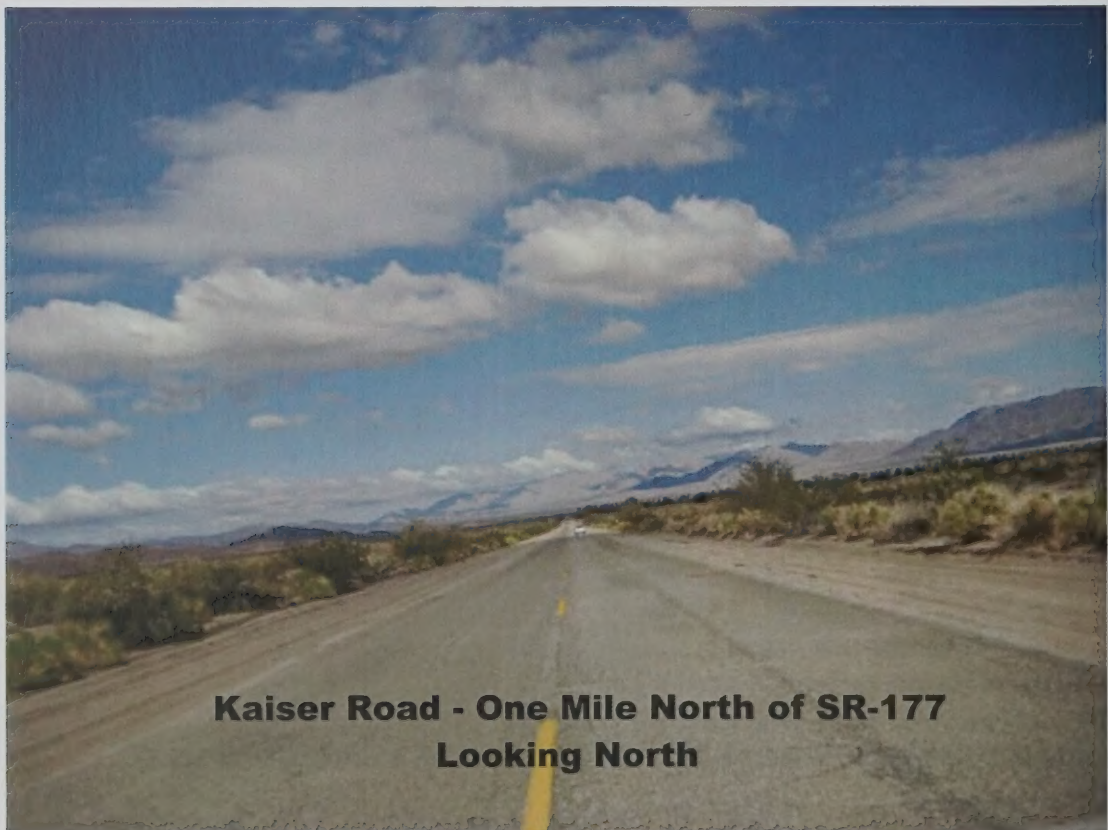
**Alternative 3:
Proposed Solar Project**



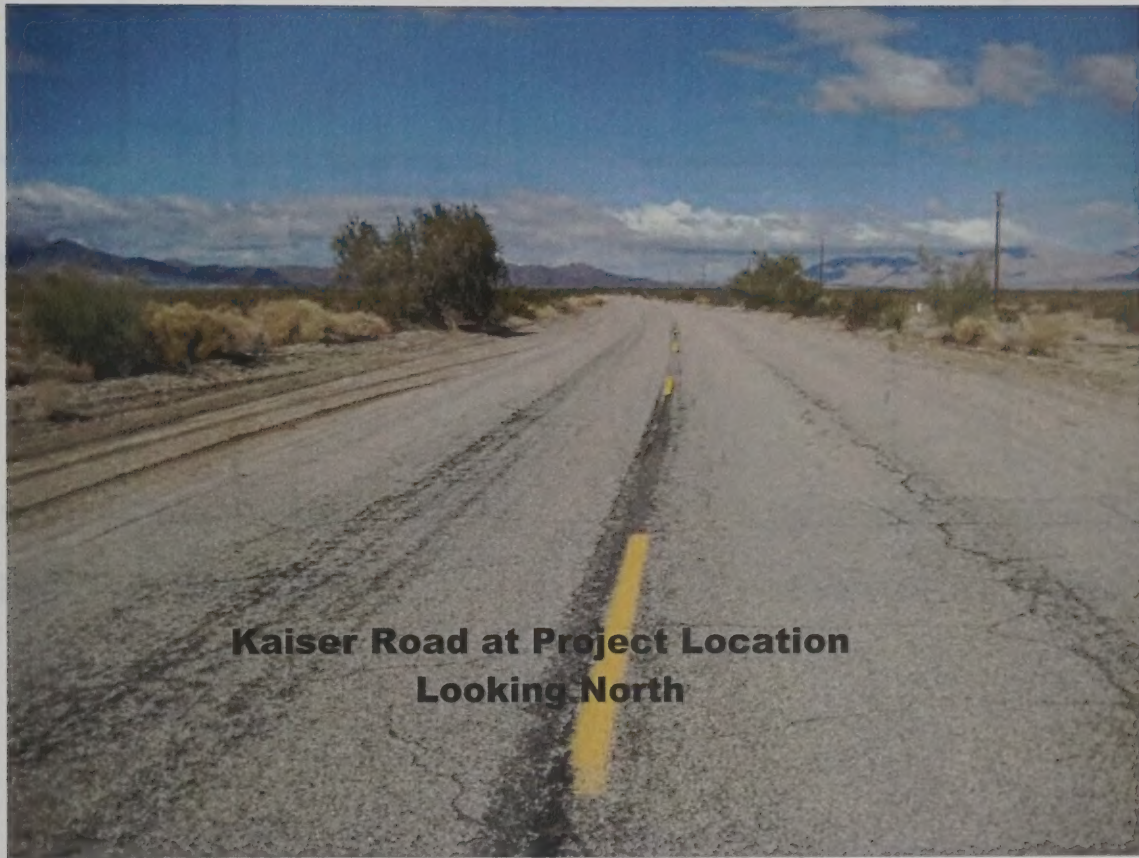
0 0.5 1 2 Miles



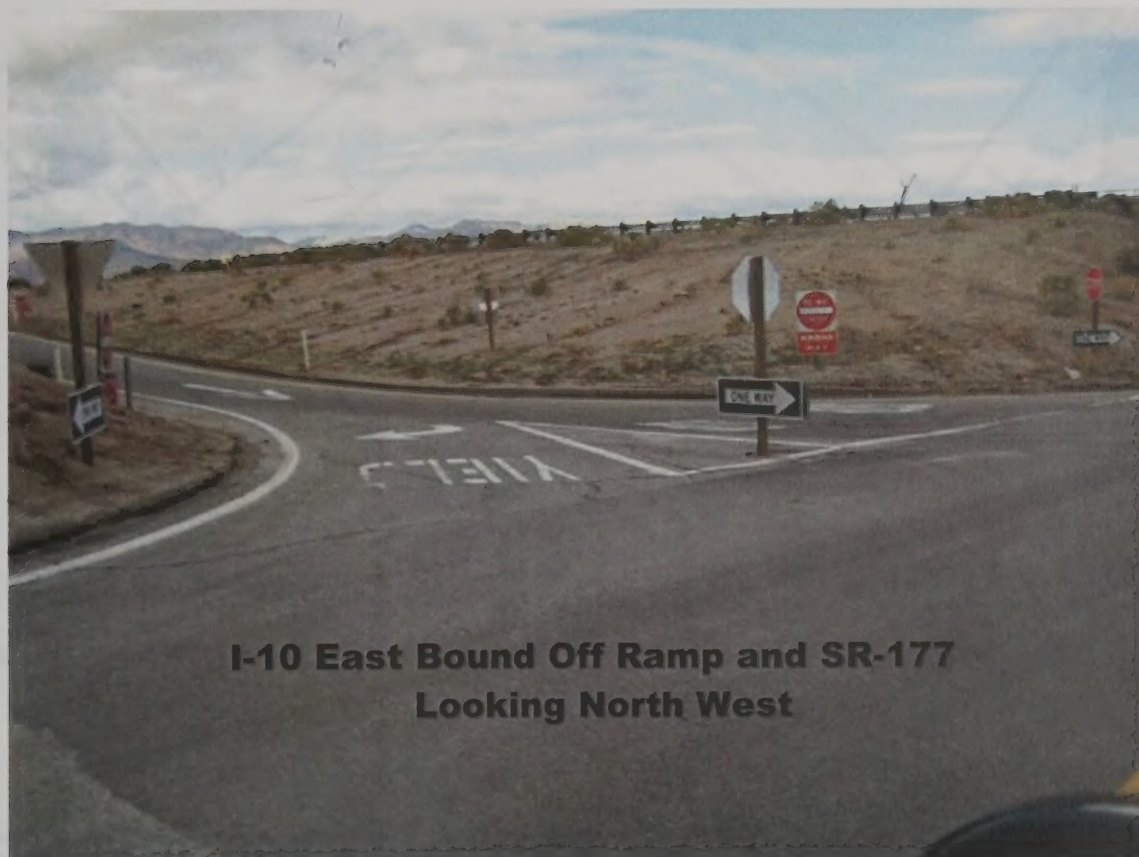
Kaiser Road & SR-177 Looking South East



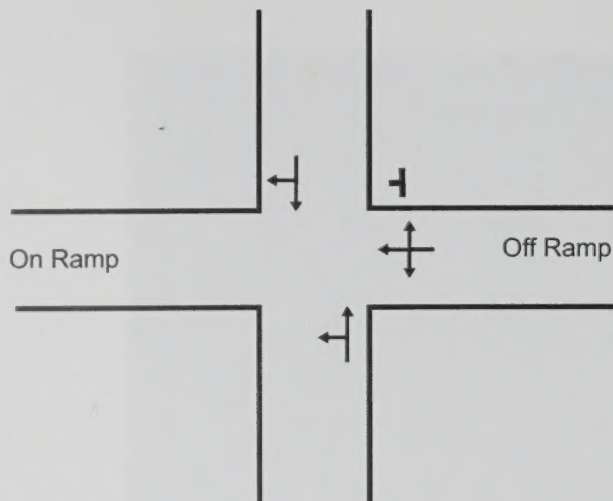
**Kaiser Road - One Mile North of SR-177
Looking North**



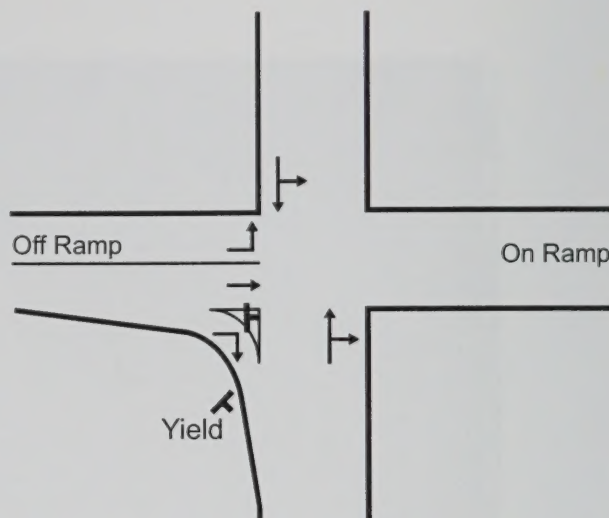
**Kaiser Road at Project Location
Looking North**



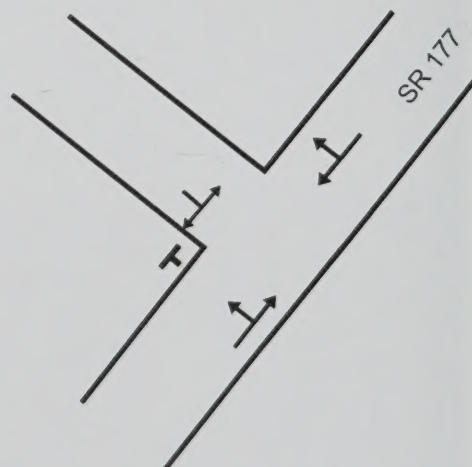
**I-10 East Bound Off Ramp and SR-177
Looking North West**



I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)

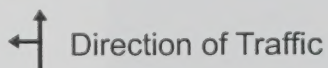


I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)

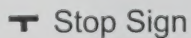


KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

Legend

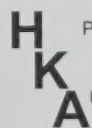


Direction of Traffic



Stop Sign

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234 EAST DRAKE DRIVE
SAN BERNARDINO, CA 92408
(909) 884-3222 FAX (909) 383-1577
E-MAIL: richardh@hkagroup.com

DESCRIPTION

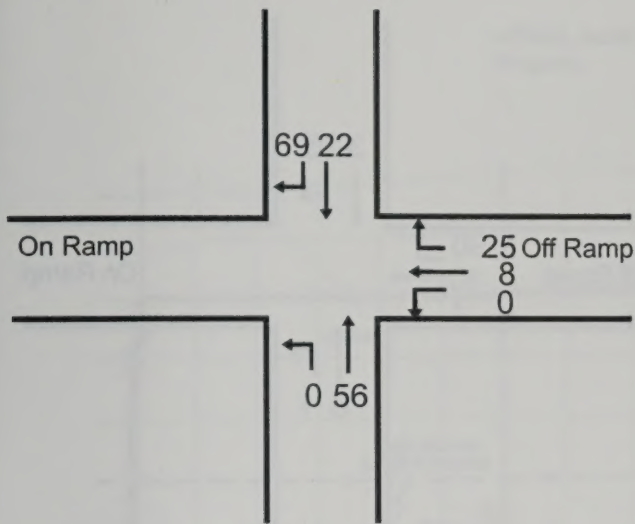
Existing Lane
Configurations
Figure 5

PROJECT NO.

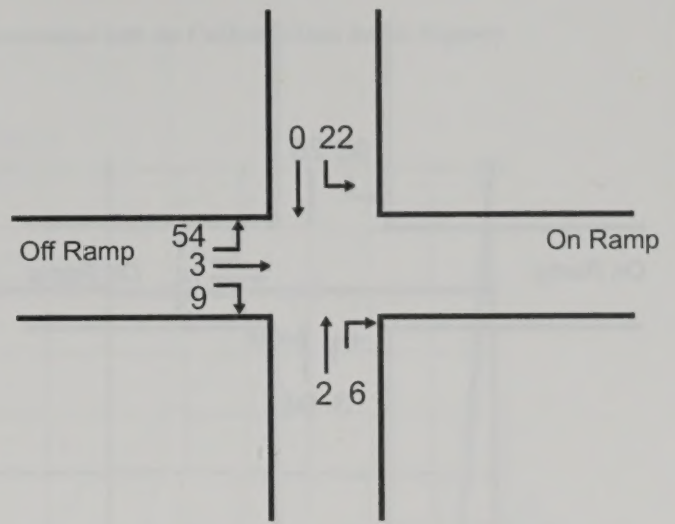
11-1027

DATE

12-02-2011



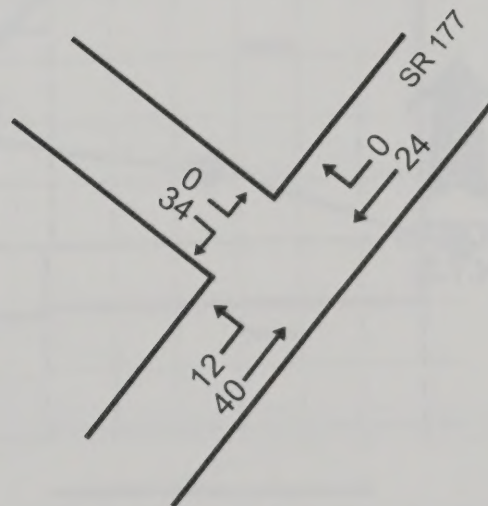
I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)



I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)

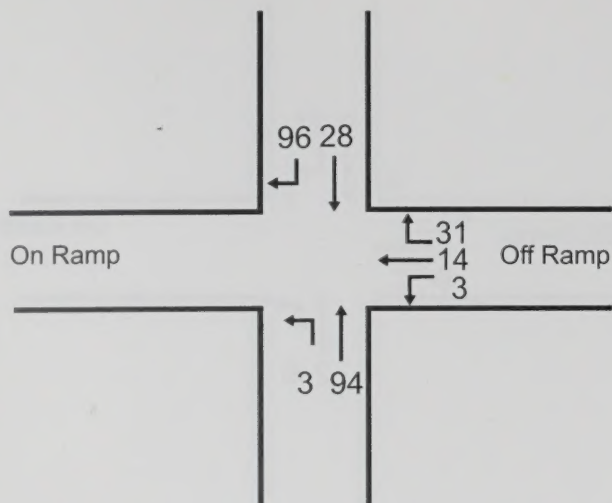


NORTH
N.T.S.

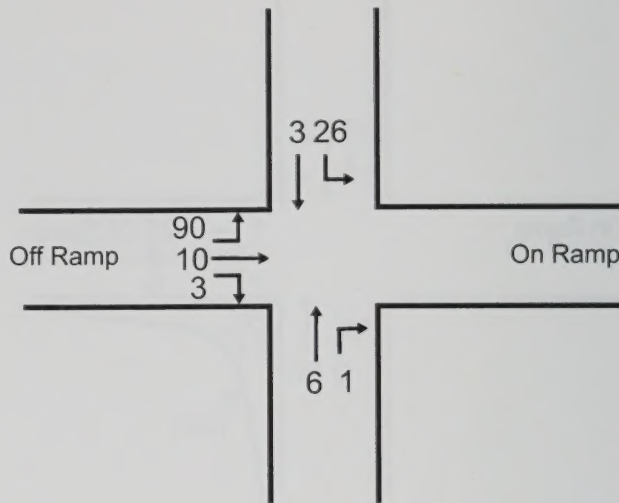


KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

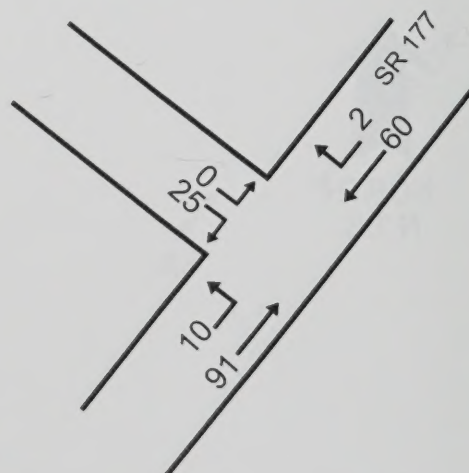
Hernandez, Kroone & Associates, Inc - CONSULTING ENGINEERS - HK A PLANNING - DESIGN - SURVEYING 234 EAST DRAKE DRIVE SAN BERNARDINO, CA 92408 (909) 884-3222 FAX (909) 383-1577 E-MAIL: richardh@hkagroup.com	DESCRIPTION AM Existing Traffic in PCEs Figure 6A	PROJECT NO.
		11-1027
		DATE 1-23-2012



I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)

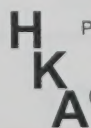


I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)



KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

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E-MAIL: richardh@hkagroup.com

DESCRIPTION

PM Existing Traffic,
in PCEs
Figure 6B

PROJECT NO.

11-1027

DATE

1-23-2012

official, scenic highway in accordance with the California State Scenic Highway Program.

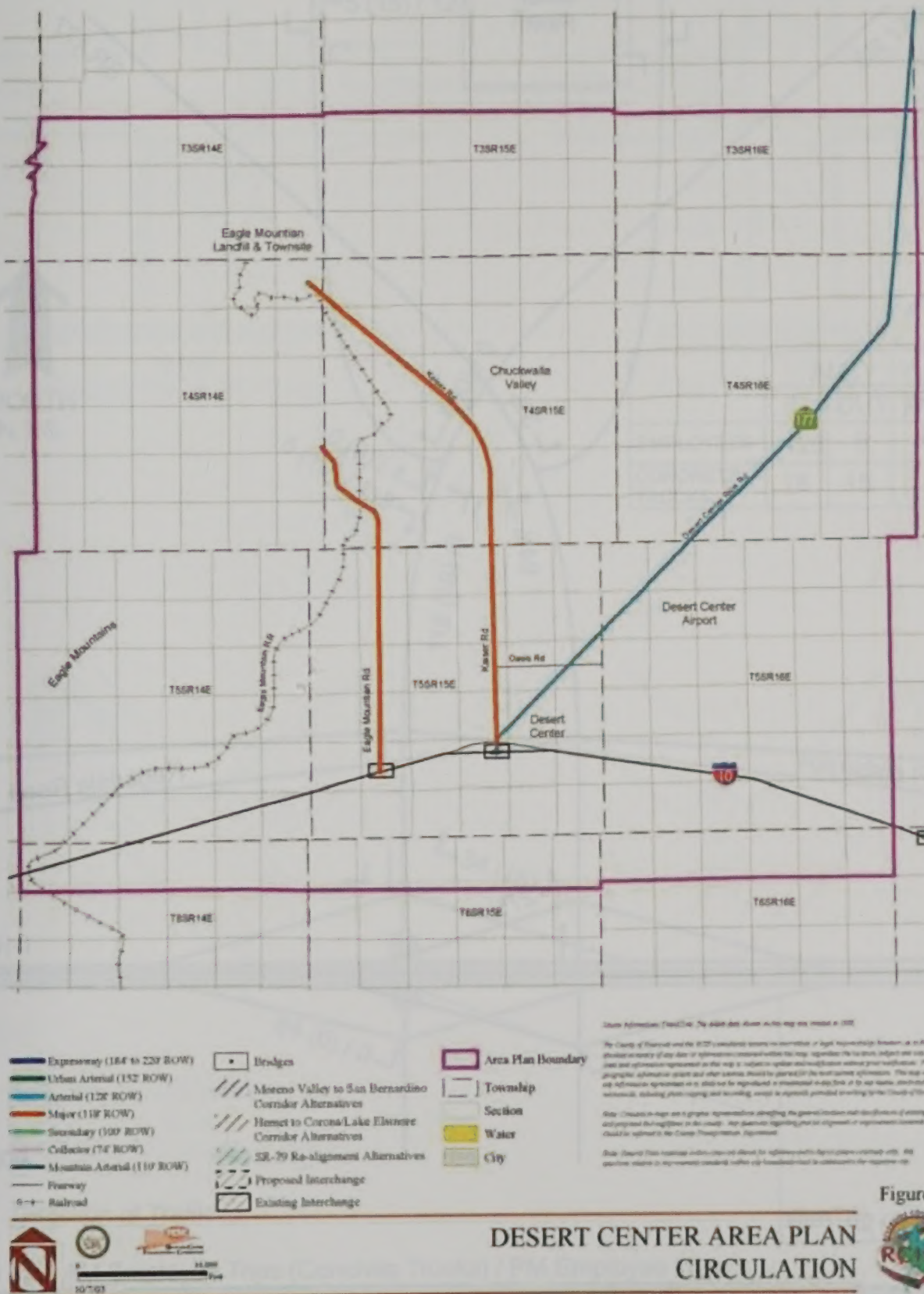
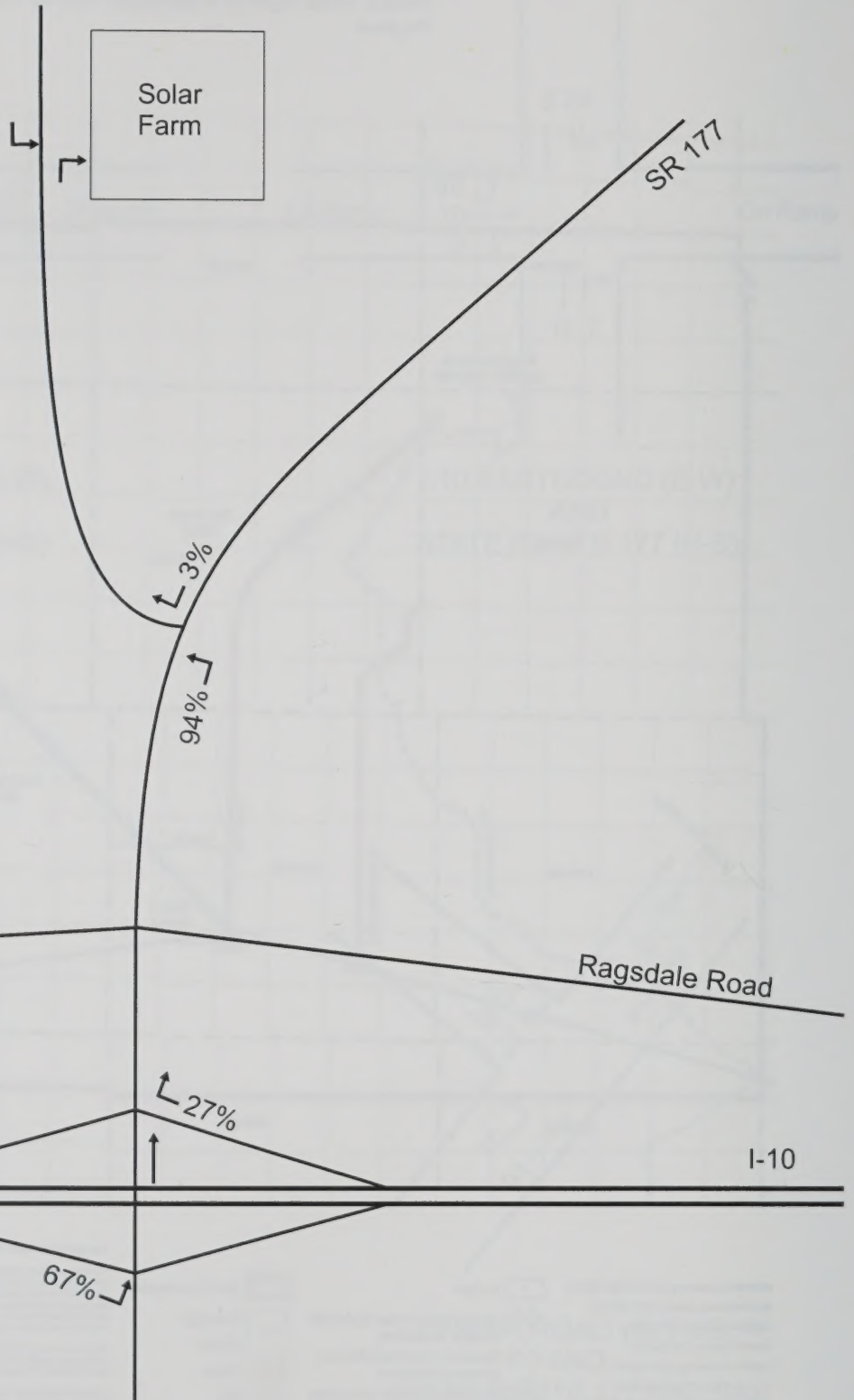


Figure 7: Trails and Bikeway System

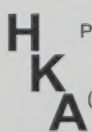
Figure 7 Circulation
County of Riverside



Legend

↑ Direction of Traffic

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DESCRIPTION

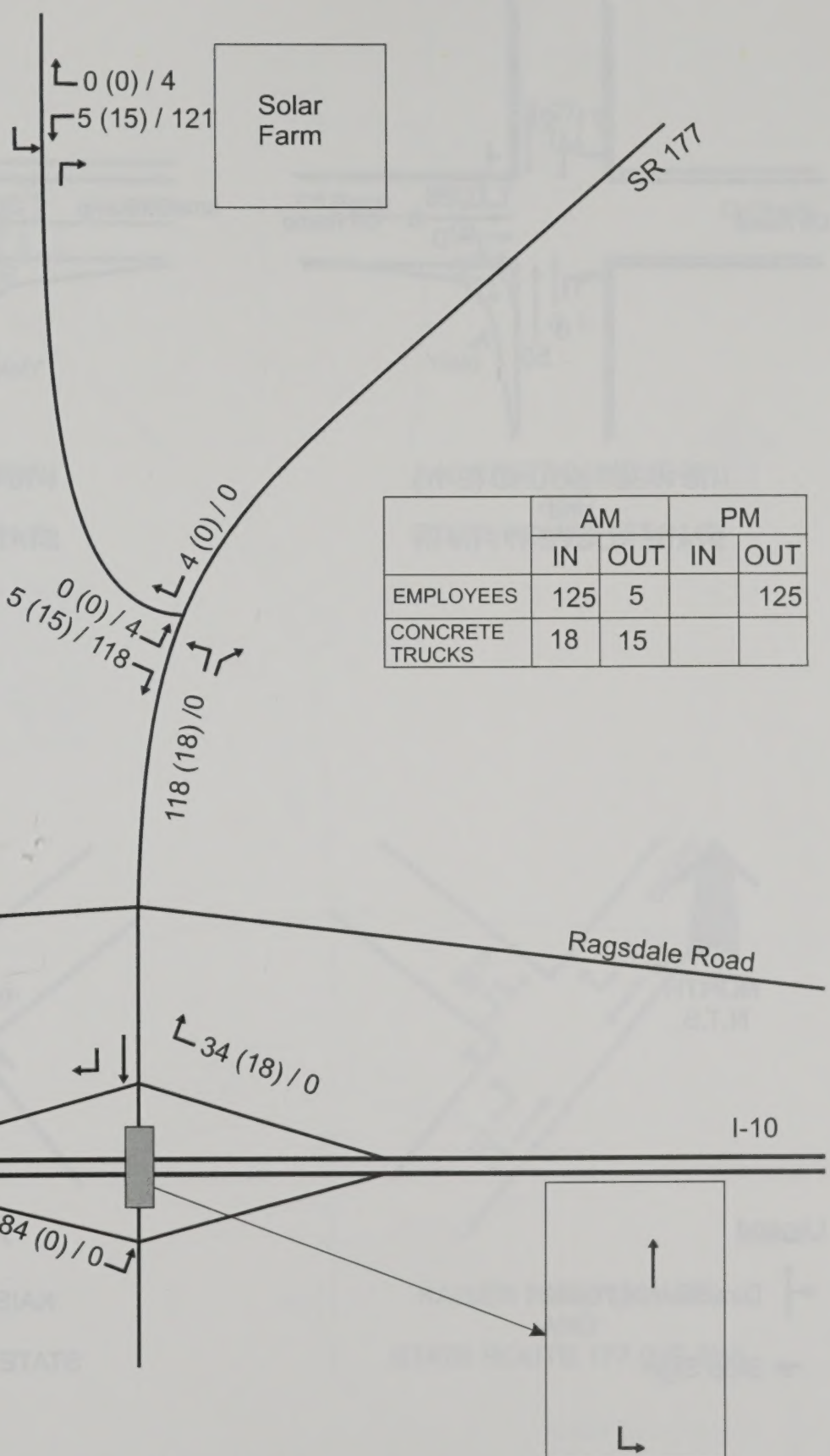
Project Trip
Distribution, %
Figure 8

PROJECT NO.

11-1027

DATE

11-23-2011



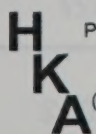
	AM		PM	
	IN	OUT	IN	OUT
EMPLOYEES	125	5		125
CONCRETE TRUCKS	18	15		

Legend

↑ Direction of Traffic

x (x) / x - AM Employee Trips (Concrete Trucks) / PM Employee Trips

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DESCRIPTION

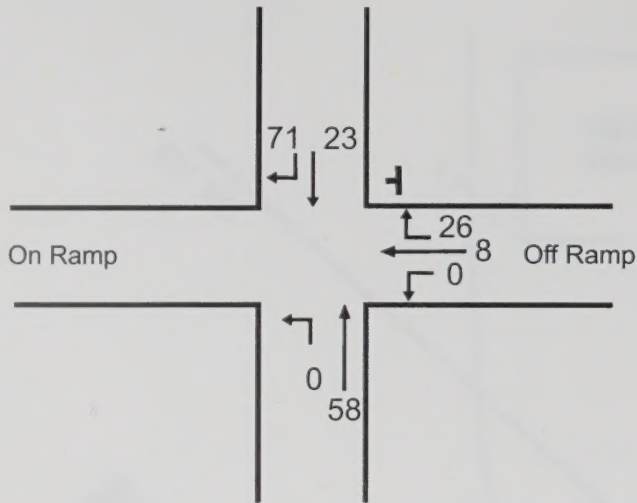
Project Trip
Distribution, PCEs
Figure 9

PROJECT NO.

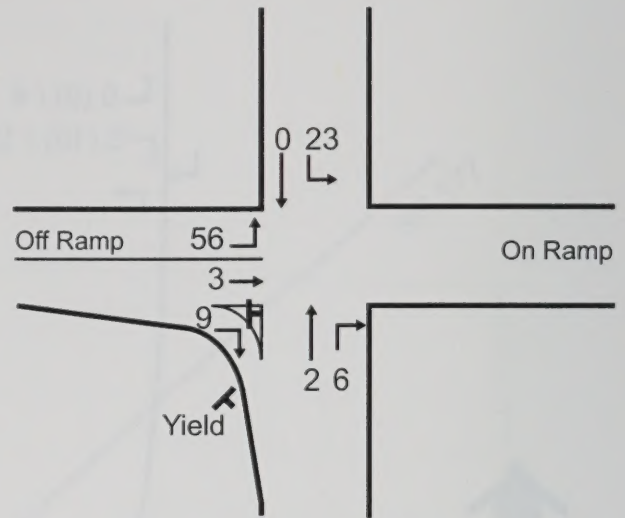
11-1027

DATE

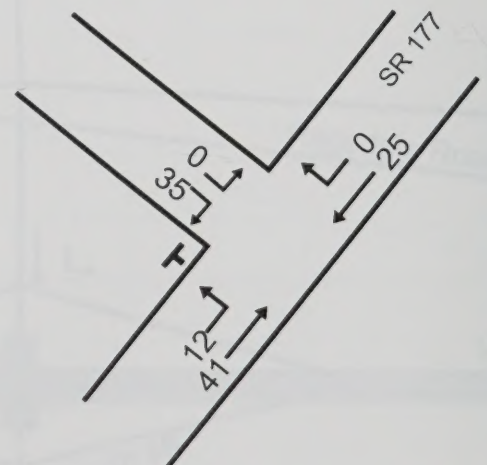
1-21-2012



I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)

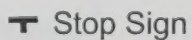
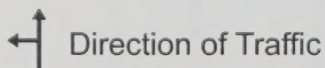


I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)

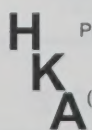


KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

Legend



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PLANNING - DESIGN - SURVEYING
234 EAST DRAKE DRIVE
SAN BERNARDINO, CA 92408
(909) 884-3222 FAX (909) 383-1577
E-MAIL: richardh@hkagroup.com

DESCRIPTION

AM Background Traffic adjusted
for Construction Period wo/Project

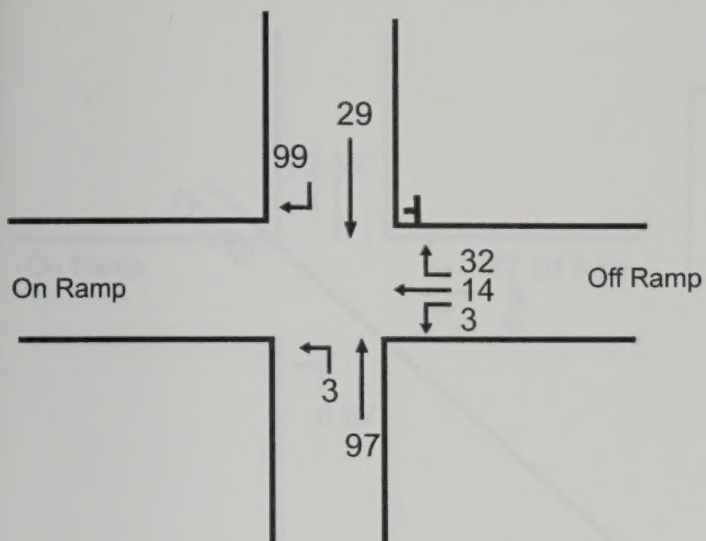
Figure 10A

PROJECT NO.

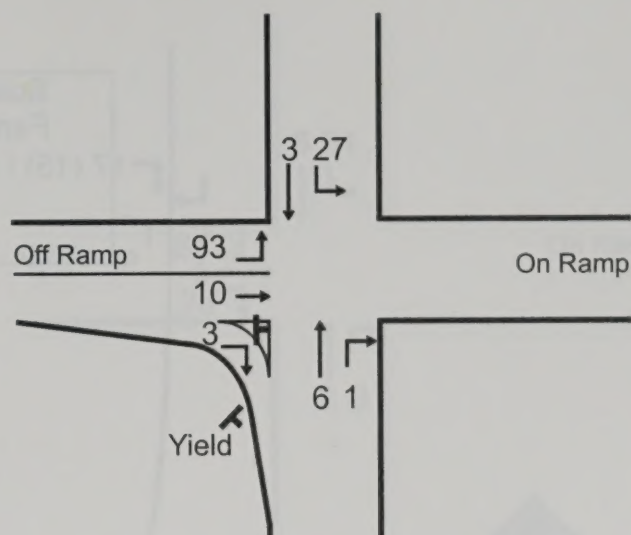
11-1027

DATE

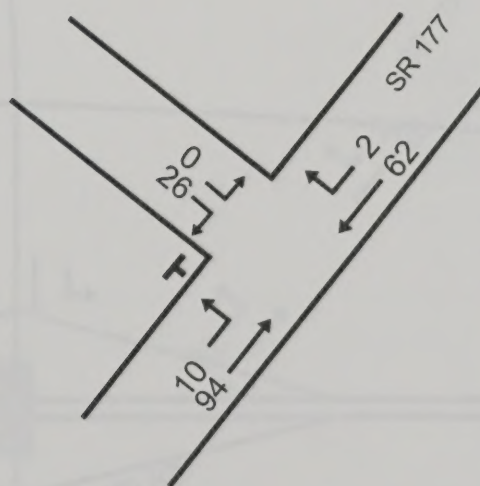
1-23-2012



I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)

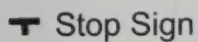
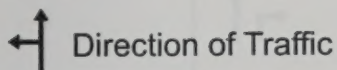


I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)

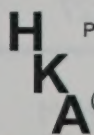


KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

Legend



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(909) 884-3222 FAX (909) 383-1577
E-MAIL: richardh@hkagroup.com

DESCRIPTION

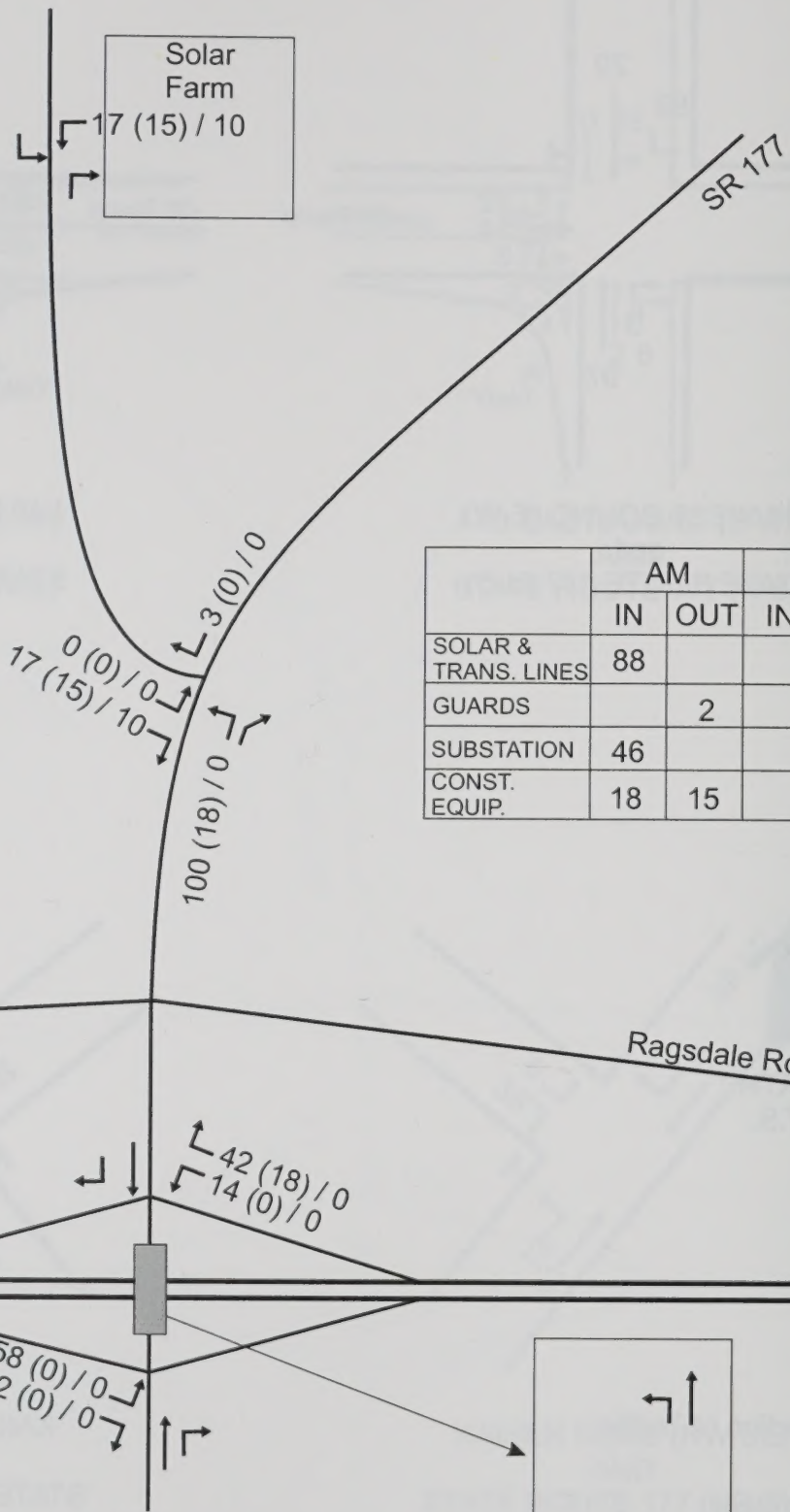
PM Background Traffic Adjusted
for Construction Period wo/Project
Figure 10B

PROJECT NO.

11-1027

DATE

1-23-2012



	AM		PM	
	IN	OUT	IN	OUT
SOLAR & TRANS. LINES	88			10
GUARDS		2		
SUBSTATION	46			8
CONST. EQUIP.	18	15		

Legend

↕ Direction of Traffic

x (x) / x - AM Trips (Equipment Trips) / PM Trips

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**H
K
A**

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234 EAST DRAKE DRIVE
SAN BERNARDINO, CA 92408
(909) 884-3222 FAX (909) 383-1577
E-MAIL: richardh@hkagroup.com

DESCRIPTION

Desert Sunlight Solar Farm

Project Trips

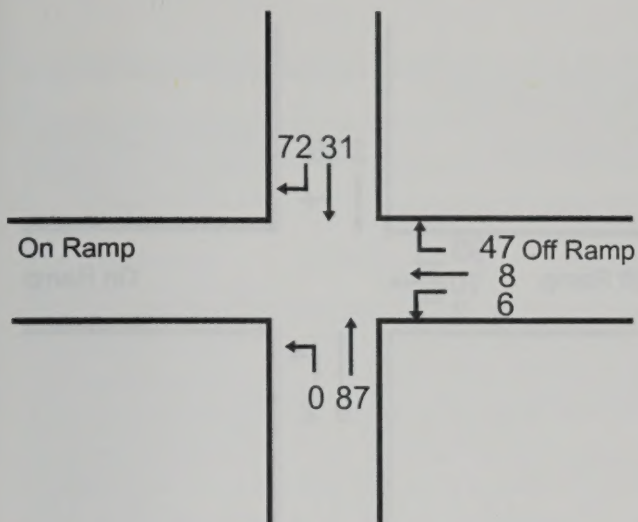
Figure 11

PROJECT NO.

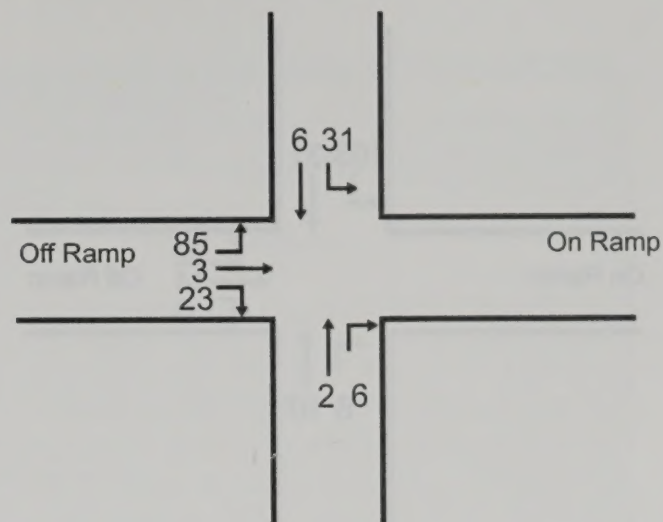
11-1027

DATE

12-02-2011



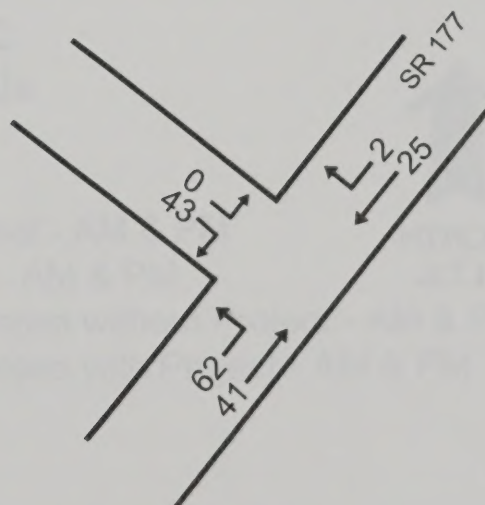
I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)



I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)

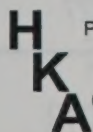


NORTH
N.T.S.



KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

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E-MAIL: richardh@hkagroup.com

DESCRIPTION

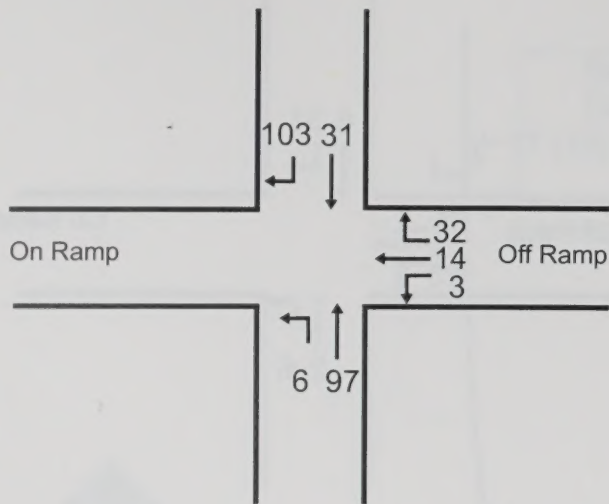
AM Background with Cumulative
Traffic Volumes,
in PCEs
Figure 12A

PROJECT NO.

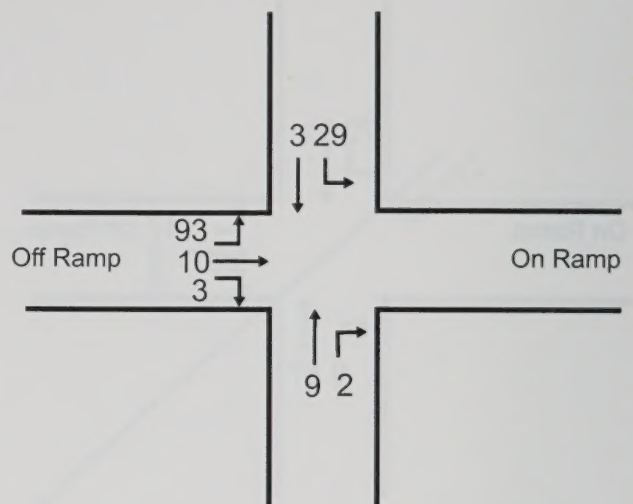
11-1027

DATE

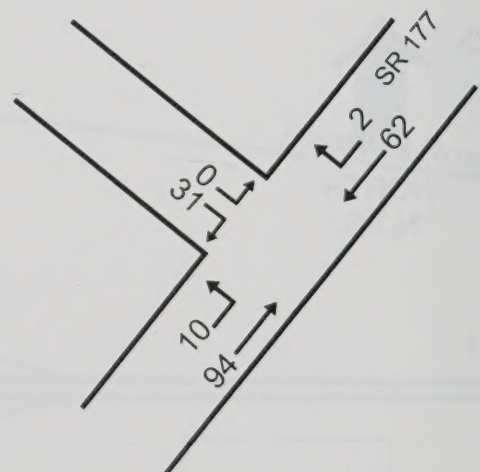
1-23-2012



I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)

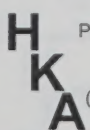


I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)



KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

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(909) 884-3222 FAX (909) 383-1577
E-MAIL: richardh@hkagroup.com

DESCRIPTION

PM Background with Cumulative
Traffic Volumes,
in PCEs
Figure 12B

PROJECT NO.

11-1027

DATE

1-23-2012

Appendix C LOS Analysis

- Existing – AM & PM
- Construction Years without Project - AM & PM
- Construction Years with Project - AM & PM
- Construction and Cumulative Project without Project - AM & PM
- Construction and Cumulative Project with Project - AM & PM

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	NJC			Intersection	SR-177 / I-10 EB Off Ramp			
Agency/Co.	Hernandez, Kroone & Associates			Jurisdiction				
Date Performed	1/23/2012			Analysis Year	Existing			
Analysis Time Period	AM							
Project Description 11-1027								
East/West Street: I-10 EB Off Ramp				North/South Street: SR-177				
Intersection Orientation: North-South				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	0	2	6	22	0	0		
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83		
Hourly Flow Rate, HFR	0	2	7	26	0	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration			TR	LT				
Upstream Signal		0			0			
Minor Street	Westbound			Eastbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	0	0	0	54	3	9		
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83		
Hourly Flow Rate, HFR	0	0	0	65	3	10		
Percent Heavy Vehicles	0	0	0	0	0	0		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			1		
Lanes	0	0	0	1	1	1		
Configuration				L	T	R		
Delay, Queue Length, and Level of Service								
Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT				L	T	R
v (vph)		26				65	3	10
C (m) (vph)		1624				939	821	1091
v/c		0.02				0.07	0.00	0.01
95% queue length		0.05				0.22	0.01	0.03
Control Delay		7.3				9.1	9.4	8.3
LOS		A				A	A	A
Approach Delay	--	--				9.0		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / I-10 EB Off Ramp
Agency/Co.	Hernandez, Kroone & Associates	Jurisdiction	
Date Performed	1/23/2012	Analysis Year	Existing
Analysis Time Period	PM		
Project Description 11-1027			
East/West Street: I-10 EB Off Ramp		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	6	1	26	3	0
Peak-Hour Factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Hourly Flow Rate, HFR	0	6	1	26	3	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	90	10	3
Peak-Hour Factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Hourly Flow Rate, HFR	0	0	0	92	10	3
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	1	1	1
Configuration				L	T	R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT				L	T	R
v (vph)		26				92	10	3
C (m) (vph)		1627				935	820	1087
v/c		0.02				0.10	0.01	0.00
95% queue length		0.05				0.33	0.04	0.01
Control Delay		7.2				9.3	9.4	8.3
LOS		A				A	A	A
Approach Delay	--	--				9.3		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information				Site Information				
Analyst	NJC			Intersection	SR-177 / I-10 WB OFF RAMP			
Agency/Co.	HERNANDEZ KROONE & ASSOCIATES			Jurisdiction				
Date Performed	1/23/2012			Analysis Year	EXISTING			
Analysis Time Period	AM							
Project Description 11-1027								
East/West Street: I-10 WB OFF RAMP				North/South Street: SR-177				
Intersection Orientation: North-South				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	0	56	0	0	22	69		
Peak-Hour Factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81		
Hourly Flow Rate, HFR	0	69	0	0	27	85		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration	LT					TR		
Upstream Signal		0			0			
Minor Street	Westbound			Eastbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	0	8	25	0	0	0		
Peak-Hour Factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81		
Hourly Flow Rate, HFR	0	9	30	0	0	0		
Percent Heavy Vehicles	0	0	0	0	0	0		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	1	0	0	0	0		
Configuration		LTR						
Delay, Queue Length, and Level of Service								
Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (vph)	0			39				
C (m) (vph)	1490			917				
v/c	0.00			0.04				
95% queue length	0.00			0.13				
Control Delay	7.4			9.1				
LOS	A			A				
Approach Delay	--	--	9.1					
Approach LOS	--	--	A					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / I-10 WB OFF RAMP
Agency/Co.	HERNANDEZ KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/23/2012	Analysis Year	EXISTING
Analysis Time Period	PM		
Project Description 11-1027			
East/West Street: I-10 WB OFF RAMP		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	3	94	0	0	28	96
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR	3	110	0	0	32	112
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	3	14	31	0	0	0
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR	3	16	36	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (vph)	3			55				
C (m) (vph)	1451			827				
v/c	0.00			0.07				
95% queue length	0.01			0.21				
Control Delay	7.5			9.7				
LOS	A			A				
Approach Delay	--	--	9.7					
Approach LOS	--	--	A					

TWO-WAY STOP CONTROL SUMMARY								
General Information					Site Information			
Analyst	NJC				Intersection	SR-177 / KAISER ROAD		
Agency/Co.	HERNANDEZ, KROONE & ASSOCIATES				Jurisdiction			
Date Performed	1/23/2012				Analysis Year	Existing		
Analysis Time Period	AM							
Project Description 11-1027								
East/West Street: KAISER ROAD					North/South Street: SR-177			
Intersection Orientation: North-South					Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	12	40	0	0	24	0		
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly Flow Rate, HFR	13	44	0	0	26	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration	LT					TR		
Upstream Signal		0			0			
Minor Street	Westbound			Eastbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	0	0	0	0	0	34		
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly Flow Rate, HFR	0	0	0	0	0	37		
Percent Heavy Vehicles	0	0	0	0	0	0		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	0		
Configuration					LR			
Delay, Queue Length, and Level of Service								
Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	13						37	
C (m) (vph)	1601						1056	
v/c	0.01						0.04	
95% queue length	0.02						0.11	
Control Delay	7.3						8.5	
LOS	A						A	
Approach Delay	--	--				8.5		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / KAISER ROAD
Agency/Co.	HERNANDEZ, KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/23/2012	Analysis Year	EXISTING
Analysis Time Period	PM		
Project Description 11-1027			
East/West Street: KAISER ROAD		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	91	0	0	60	2
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Hourly Flow Rate, HFR	13	121	0	0	80	2
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	0	0	25
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Hourly Flow Rate, HFR	0	0	0	0	0	33
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	13						33	
C (m) (vph)	1528						985	
v/c	0.01						0.03	
95% queue length	0.03						0.10	
Control Delay	7.4						8.8	
LOS	A						A	
Approach Delay	--	--				8.8		
Approach LOS	--	--				A		

TWO-WAY STOP CONTROL SUMMARY								
General Information					Site Information			
Analyst	NJC				Intersection	SR-177 / I-10 EB Off Ramp		
Agency/Co.	Hernandez, Kroone & Associates				Jurisdiction			
Date Performed	12/2/2011				Analysis Year	Const w/o Project		
Analysis Time Period	AM							
Project Description 11-1027								
East/West Street: I-10 EB Off Ramp					North/South Street: SR-177			
Intersection Orientation: North-South					Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	0	2	6	23	0	0		
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83		
Hourly Flow Rate, HFR	0	2	7	27	0	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration			TR	LT				
Upstream Signal		0			0			
Minor Street	Westbound			Eastbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	0	0	0	56	3	9		
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83		
Hourly Flow Rate, HFR	0	0	0	67	3	10		
Percent Heavy Vehicles	0	0	0	0	0	0		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			1		
Lanes	0	0	0	1	1	1		
Configuration				L	T	R		
Delay, Queue Length, and Level of Service								
Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT				L	T	R
v (vph)		27				67	3	10
C (m) (vph)		1624				936	818	1091
v/c		0.02				0.07	0.00	0.01
95% queue length		0.05				0.23	0.01	0.03
Control Delay		7.3				9.1	9.4	8.3
LOS		A				A	A	A
Approach Delay	--	--				9.1		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / I-10 EB Off Ramp
Agency/Co.	Hernandez, Kroone & Associates	Jurisdiction	
Date Performed	12/2/2011	Analysis Year	Construction w/o Project
Analysis Time Period	PM		
Project Description 11-1027			
East/West Street: I-10 EB Off Ramp		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	6	1	27	3	0
Peak-Hour Factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Hourly Flow Rate, HFR	0	6	1	27	3	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	93	10	3
Peak-Hour Factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Hourly Flow Rate, HFR	0	0	0	95	10	3
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	1	1	1
Configuration				L	T	R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT				L	T	R
v (vph)		27				95	10	3
C (m) (vph)		1627				932	817	1087
v/c		0.02				0.10	0.01	0.00
95% queue length		0.05				0.34	0.04	0.01
Control Delay		7.2				9.3	9.5	8.3
LOS		A				A	A	A
Approach Delay	--	--				9.3		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / I-10 WB OFF RAMP
Agency/Co.	HERNANDEZ KROONE & ASSOCIATES	Jurisdiction	
Date Performed	12/2/2011	Analysis Year	Const wo Project Trips
Analysis Time Period	AM		
Project Description 11-1027			
East/West Street: I-10 WB OFF RAMP		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	58	0	0	23	71
Peak-Hour Factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Hourly Flow Rate, HFR	0	71	0	0	28	87
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	8	26	0	0	0
Peak-Hour Factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Hourly Flow Rate, HFR	0	9	32	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (vph)	0			41				
C (m) (vph)	1487			916				
v/c	0.00			0.04				
95% queue length	0.00			0.14				
Control Delay	7.4			9.1				
LOS	A			A				
Approach Delay	--	--	9.1					
Approach LOS	--	--	A					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / I-10 WB OFF RAMP
Agency/Co.	HERNANDEZ KROONE & ASSOCIATES	Jurisdiction	
Date Performed	12/2/2011	Analysis Year	Construction wo Project
Analysis Time Period	PM		
Project Description 11-1027			
East/West Street: I-10 WB OFF RAMP		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	3	97	0	0	29	99
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR	3	114	0	0	34	116
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	3	14	32	0	0	0
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR	3	16	37	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (vph)	3			56				
C (m) (vph)	1444			822				
v/c	0.00			0.07				
95% queue length	0.01			0.22				
Control Delay	7.5			9.7				
LOS	A			A				
Approach Delay	--	--	9.7					
Approach LOS	--	--	A					

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TWO-WAY STOP CONTROL SUMMARY								
General Information					Site Information			
Analyst	NJC				Intersection	SR-177 / KAISER ROAD		
Agency/Co.	HERNANDEZ, KROONE & ASSOCIATES				Jurisdiction			
Date Performed	12/2/2011				Analysis Year	Const wo Project		
Analysis Time Period	AM							
Project Description 11-1027								
East/West Street: KAISER ROAD					North/South Street: SR-177			
Intersection Orientation: North-South					Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	12	41	0	0	25	0		
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly Flow Rate, HFR	13	45	0	0	27	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration	LT					TR		
Upstream Signal		0			0			
Minor Street	Westbound			Eastbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	0	0	0	0	0	35		
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly Flow Rate, HFR	0	0	0	0	0	38		
Percent Heavy Vehicles	0	0	0	0	0	0		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	0		
Configuration					LR			
Delay, Queue Length, and Level of Service								
Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	13						38	
C (m) (vph)	1600						1054	
v/c	0.01						0.04	
95% queue length	0.02						0.11	
Control Delay	7.3						8.5	
LOS	A						A	
Approach Delay	--	--				8.5		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / KAISER ROAD
Agency/Co.	HERNANDEZ, KROONE & ASSOCIATES	Jurisdiction	
Date Performed	12/2/2011	Analysis Year	Construction wo Project
Analysis Time Period	PM		
Project Description 11-1027			
East/West Street: KAISER ROAD		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	94	0	0	62	2
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Hourly Flow Rate, HFR	13	125	0	0	82	2
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	0	0	26
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Hourly Flow Rate, HFR	0	0	0	0	0	34
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	13						34	
C (m) (vph)	1526						982	
v/c	0.01						0.03	
95% queue length	0.03						0.11	
Control Delay	7.4						8.8	
LOS	A						A	
Approach Delay	--	--				8.8		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY								
General Information					Site Information			
Analyst	NJC				Intersection	SR-177 / I-10 EB Off Ramp		
Agency/Co.	Hernandez, Kroone & Associates				Jurisdiction			
Date Performed	1/23/2012				Analysis Year	Const with Project		
Analysis Time Period	AM							
Project Description 11-1027								
East/West Street: I-10 EB Off Ramp					North/South Street: SR-177			
Intersection Orientation: North-South					Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	0	2	6	41	0	0		
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83		
Hourly Flow Rate, HFR	0	2	7	49	0	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration			TR	LT				
Upstream Signal		0			0			
Minor Street	Westbound			Eastbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	0	0	0	140	3	9		
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83		
Hourly Flow Rate, HFR	0	0	0	168	3	10		
Percent Heavy Vehicles	0	0	0	0	0	0		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			1		
Lanes	0	0	0	1	1	1		
Configuration				L	T	R		
Delay, Queue Length, and Level of Service								
Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT				L	T	R
v (vph)		49				168	3	10
C (m) (vph)		1624				872	763	1091
v/c		0.03				0.19	0.00	0.01
95% queue length		0.09				0.71	0.01	0.03
Control Delay		7.3				10.1	9.7	8.3
LOS		A				B	A	A
Approach Delay	--	--				10.0		
Approach LOS	--	--				B		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / I-10 EB Off Ramp
Agency/Co.	Hernandez, Kroone & Associates	Jurisdiction	
Date Performed	1/23/2012	Analysis Year	Construction w Project
Analysis Time Period	PM		
Project Description 11-1027			
East/West Street: I-10 EB Off Ramp		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	6	1	61	3	0
Peak-Hour Factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Hourly Flow Rate, HFR	0	6	1	62	3	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	93	10	3
Peak-Hour Factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Hourly Flow Rate, HFR	0	0	0	95	10	3
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	1	1	1
Configuration				L	T	R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT				L	T	R
v (vph)		62				95	10	3
C (m) (vph)		1627				833	731	1087
v/c		0.04				0.11	0.01	0.00
95% queue length		0.12				0.38	0.04	0.01
Control Delay		7.3				9.9	10.0	8.3
LOS		A				A	A	A
Approach Delay	--	--				9.8		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information		
Analyst	NJC	Intersection	SR-177 / I-10 WB OFF RAMP	
Agency/Co.	HERNANDEZ KROONE & ASSOCIATES		Jurisdiction	
Date Performed	1/23/2012		Analysis Year	Const w Project Trips
Analysis Time Period	AM			
Project Description 11-1027				
East/West Street: I-10 WB OFF RAMP		North/South Street: SR-177		
Intersection Orientation: North-South		Study Period (hrs): 0.25		

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	142	0	0	41	75
Peak-Hour Factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Hourly Flow Rate, HFR	0	175	0	0	50	92
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	8	78	0	0	0
Peak-Hour Factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Hourly Flow Rate, HFR	0	9	96	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (vph)	0			105				
C (m) (vph)	1453			841				
v/c	0.00			0.12				
95% queue length	0.00			0.43				
Control Delay	7.5			9.9				
LOS	A			A				
Approach Delay	--	--		9.9				
Approach LOS	--	--		A				

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / I-10 WB OFF RAMP
Agency/Co.	HERNANDEZ KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/23/2012	Analysis Year	Construction w Project
Analysis Time Period	PM		
Project Description 11-1027			
East/West Street: I-10 WB OFF RAMP		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	3	97	0	0	63	183
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR	3	114	0	0	74	215
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	3	14	32	0	0	0
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR	3	16	37	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (vph)	3			56				
C (m) (vph)	1284			762				
v/c	0.00			0.07				
95% queue length	0.01			0.24				
Control Delay	7.8			10.1				
LOS	A			B				
Approach Delay	--	--	10.1					
Approach LOS	--	--	B					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / KAISER ROAD
Agency/Co.	HERNANDEZ, KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/23/2012	Analysis Year	Construction w Project
Analysis Time Period	AM		
Project Description 11-1027			
East/West Street: KAISER ROAD		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	148	41	0	0	25	4
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	164	45	0	0	27	4
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	0	0	55
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	0	0	0	0	0	61
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	164						61	
C (m) (vph)	1595						1052	
v/c	0.10						0.06	
95% queue length	0.34						0.18	
Control Delay	7.5						8.6	
LOS	A						A	
Approach Delay	--	--					8.6	
Approach LOS	--	--					A	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / KAISER ROAD
Agency/Co.	HERNANDEZ, KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/23/2012	Analysis Year	Construction w Project
Analysis Time Period	PM		
Project Description 11-1027			
East/West Street: KAISER ROAD		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	94	0	0	62	2
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Hourly Flow Rate, HFR	13	125	0	0	82	2
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	4	0	144
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Hourly Flow Rate, HFR	0	0	0	5	0	192
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	13						197	
C (m) (vph)	1526						974	
v/c	0.01						0.20	
95% queue length	0.03						0.75	
Control Delay	7.4						9.6	
LOS	A						A	
Approach Delay	--	--				9.6		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information				Site Information				
Analyst	NJC			Intersection	SR-177 / I-10 EB Off Ramp			
Agency/Co.	Hernandez, Kroone & Associates			Jurisdiction				
Date Performed	1/24/2012			Analysis Year	Const&Cumulative wo Project			
Analysis Time Period	AM							
Project Description 11-1027								
East/West Street: I-10 EB Off Ramp				North/South Street: SR-177				
Intersection Orientation: North-South				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	0	2	6	39	7	0		
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83		
Hourly Flow Rate, HFR	0	2	7	46	8	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration			TR	LT				
Upstream Signal		0			0			
Minor Street	Westbound			Eastbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	0	0	0	85	3	25		
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83		
Hourly Flow Rate, HFR	0	0	0	102	3	30		
Percent Heavy Vehicles	0	0	0	0	0	0		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			1		
Lanes	0	0	0	1	1	1		
Configuration				L	T	R		
Delay, Queue Length, and Level of Service								
Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT				L	T	R
v (vph)		46				102	3	30
C (m) (vph)		1624				872	763	1080
v/c		0.03				0.12	0.00	0.03
95% queue length		0.09				0.40	0.01	0.09
Control Delay		7.3				9.7	9.7	8.4
LOS		A				A	A	A
Approach Delay	--	--				9.4		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	NJC		Intersection	SR-177 / I-10 EB Off Ramp
Agency/Co.	Hernandez, Kroone & Associates		Jurisdiction	
Date Performed	12/2/2011		Analysis Year	Const&Cumulative wo Project
Analysis Time Period	PM			
Project Description 11-1027				
East/West Street: I-10 EB Off Ramp			North/South Street: SR-177	
Intersection Orientation: North-South			Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	9	2	29	3	0
Peak-Hour Factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Hourly Flow Rate, HFR	0	9	2	29	3	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0		0		
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	93	10	3
Peak-Hour Factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Hourly Flow Rate, HFR	0	0	0	95	10	3
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	1	1	1
Configuration				L	T	R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT				L	T	R
v (vph)		29				95	10	3
C (m) (vph)		1621				921	807	1087
v/c		0.02				0.10	0.01	0.00
95% queue length		0.05				0.34	0.04	0.01
Control Delay		7.3				9.4	9.5	8.3
LOS		A				A	A	A
Approach Delay	--	--				9.3		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / I-10 WB OFF RAMP
Agency/Co.	HERNANDEZ KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/24/2012	Analysis Year	Const&Cumulative wo Project
Analysis Time Period	AM		
Project Description 11-1027			
East/West Street: I-10 WB OFF RAMP		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	87	0	0	39	71
Peak-Hour Factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Hourly Flow Rate, HFR	0	107	0	0	48	87
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	7	8	56	0	0	0
Peak-Hour Factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Hourly Flow Rate, HFR	8	9	69	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (vph)	0			86				
C (m) (vph)	1462			895				
v/c	0.00			0.10				
95% queue length	0.00			0.32				
Control Delay	7.5			9.4				
LOS	A			A				
Approach Delay	--	--	9.4					
Approach LOS	--	--	A					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / I-10 WB OFF RAMP
Agency/Co.	HERNANDEZ KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/23/2012	Analysis Year	Const&Cumulative wo Project
Analysis Time Period	PM		
Project Description 11-1027			
East/West Street: I-10 WB OFF RAMP		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	6	97	0	0	31	103
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR	7	114	0	0	36	121
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	3	14	32	0	0	0
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR	3	16	37	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (vph)	7			56				
C (m) (vph)	1435			815				
v/c	0.00			0.07				
95% queue length	0.01			0.22				
Control Delay	7.5			9.7				
LOS	A			A				
Approach Delay	--	--		9.7				
Approach LOS	--	--		A				

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / KAISER ROAD
Agency/Co.	HERNANDEZ, KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/25/2012	Analysis Year	Const&Cumulative wo Project
Analysis Time Period	AM		
Project Description 11-1027			
East/West Street: KAISER ROAD		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	71	41	0	0	25	2
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	78	45	0	0	27	2
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	0	0	51
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	0	0	0	0	0	56
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	78						56	
C (m) (vph)	1597						1053	
v/c	0.05						0.05	
95% queue length	0.15						0.17	
Control Delay	7.4						8.6	
LOS	A						A	
Approach Delay	--	--					8.6	
Approach LOS	--	--					A	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / KAISER ROAD
Agency/Co.	HERNANDEZ, KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/25/2012	Analysis Year	Const&Cumulative wo Project
Analysis Time Period	PM		
Project Description 11-1027			
East/West Street: KAISER ROAD		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	94	0	0	62	2
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Hourly Flow Rate, HFR	13	125	0	0	82	2
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	0	0	26
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Hourly Flow Rate, HFR	0	0	0	0	0	34
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	13						34	
C (m) (vph)	1526						982	
v/c	0.01						0.03	
95% queue length	0.03						0.11	
Control Delay	7.4						8.8	
LOS	A						A	
Approach Delay	--	--				8.8		
Approach LOS	--	--				A		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / I-10 EB Off Ramp
Agency/Co.	Hernandez, Kroone & Associates	Jurisdiction	
Date Performed	1/24/2012	Analysis Year	Const&Cumulative w Project
Analysis Time Period	AM		
Project Description 11-1027			
East/West Street: I-10 EB Off Ramp		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	2	6	57	7	0
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Hourly Flow Rate, HFR	0	2	7	68	8	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	169	3	25
Peak-Hour Factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Hourly Flow Rate, HFR	0	0	0	203	3	30
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	1	1	1
Configuration				L	T	R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT				L	T	R
v (vph)		68				203	3	30
C (m) (vph)		1624				812	711	1080
v/c		0.04				0.25	0.00	0.03
95% queue length		0.13				0.99	0.01	0.09
Control Delay		7.3				10.9	10.1	8.4
LOS		A				B	B	A
Approach Delay	--	--				10.6		
Approach LOS	--	--				B		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst NJC
 Agency/Co. Hernandez, Kroone & Associates
 Date Performed 1/24/2012
 Analysis Time Period PM

Site Information

Intersection SR-177 / I-10 EB Off Ramp
 Jurisdiction
 Analysis Year Const&Cumulative w Project

Project Description 11-1027

East/West Street: I-10 EB Off Ramp

North/South Street: SR-177

Intersection Orientation: North-South

Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	9	2	63	3	0
Peak-Hour Factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Hourly Flow Rate, HFR	0	9	2	64	3	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	93	10	3
Peak-Hour Factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Hourly Flow Rate, HFR	0	0	0	95	10	3
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	1	1	1
Configuration				L	T	R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT				L	T	R
v (vph)		64				95	10	3
C (m) (vph)		1621				823	723	1087
v/c		0.04				0.12	0.01	0.00
95% queue length		0.12				0.39	0.04	0.01
Control Delay		7.3				9.9	10.0	8.3
LOS		A				A	B	A
Approach Delay	--	--				9.9		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / I-10 WB OFF RAMP
Agency/Co.	HERNANDEZ KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/24/2012	Analysis Year	Const&Cumulative w Project
Analysis Time Period	AM		
Project Description 11-1027			
East/West Street: I-10 WB OFF RAMP		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	171	0	0	57	75
Peak-Hour Factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Hourly Flow Rate, HFR	0	211	0	0	70	92
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	7	8	108	0	0	0
Peak-Hour Factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Hourly Flow Rate, HFR	8	9	133	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (vph)	0			150				
C (m) (vph)	1429			800				
v/c	0.00			0.19				
95% queue length	0.00			0.69				
Control Delay	7.5			10.5				
LOS	A			B				
Approach Delay	--	--		10.5				
Approach LOS	--	--		B				

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / I-10 WB OFF RAMP
Agency/Co.	HERNANDEZ KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/24/2012	Analysis Year	Const&Cumulative w Project
Analysis Time Period	PM		
Project Description 11-1027			
East/West Street: I-10 WB OFF RAMP		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	6	97	0	0	65	187
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR	7	114	0	0	76	219
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	3	14	32	0	0	0
Peak-Hour Factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Hourly Flow Rate, HFR	3	16	37	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT		LTR					
v (vph)	7		56					
C (m) (vph)	1278		755					
v/c	0.01		0.07					
95% queue length	0.02		0.24					
Control Delay	7.8		10.1					
LOS	A		B					
Approach Delay	--	--	10.1					
Approach LOS	--	--	B					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / KAISER ROAD
Agency/Co.	HERNANDEZ, KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/24/2012	Analysis Year	Const&Cumulative w Project
Analysis Time Period	AM		
Project Description 11-1027			
East/West Street: KAISER ROAD		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	207	41	0	0	25	6
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	230	45	0	0	27	6
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	0	0	71
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	0	0	0	0	0	78
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	230						78	
C (m) (vph)	1592						1050	
v/c	0.14						0.07	
95% queue length	0.51						0.24	
Control Delay	7.6						8.7	
LOS	A						A	
Approach Delay	--	--					8.7	
Approach LOS	--	--					A	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / KAISER ROAD
Agency/Co.	HERNANDEZ, KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/24/2012	Analysis Year	Const&Cumulative w Project
Analysis Time Period	PM		
Project Description 11-1027			
East/West Street: KAISER ROAD		North/South Street: SR-177	
Intersection Orientation: North-South		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	94	0	0	62	2
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Hourly Flow Rate, HFR	13	125	0	0	82	2
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	4	0	144
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Hourly Flow Rate, HFR	0	0	0	5	0	192
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	13						197	
C (m) (vph)	1526						974	
v/c	0.01						0.20	
95% queue length	0.03						0.75	
Control Delay	7.4						9.6	
LOS	A						A	
Approach Delay	--	--				9.6		
Approach LOS	--	--				A		

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Appendix I

Cultural Resources – Tribal Contact List

Desert Harvest Tribal Contact List

Richard Milanovich, Chairman
Agua Caliente Band of Cahuilla Indians
5401 Dinah Shore Drive
Palm Springs, CA 92264

Mary Ann Green, Chairwoman
Augustine Band of Cahuilla Indians
P.O. Box 846
Coachella, CA 92236

David Roosevelt, Chairman
Cabazon Band of Mission Indians
84-245 Indio Springs Parkway
Indio, CA 92203-3449

Charles Wood, Chairman
Chemehuevi Indian Tribe
P.O. Box 1976
Havasupai Lake, CA 92363

Sherry Cordova, Chairwoman
Cocopah Indian Tribe
14515 S. Veterans Dr
Somerton, AZ 85350

Eldred Enas, Chairman
Colorado River Indian Tribes
26600 Mohave Road
Parker, AZ 85344

Timothy Williams, Chairman
Fort Mojave Indian Tribe
500 Merriman Avenue
Needles, CA 92363

Keeny Escalanti, Sr., President
Fort Yuma Quechan Tribe
P.O. Box 1899
Yuma, AZ 85366-1899

Robert Martin, Chairman
Morongo Band of Mission Indians
12700 Pumarra Rd.
Banning, CA 92220

Mary Resvaloso, Chairwoman
Torres-Martinez Desert Cahuilla Indians
P.O. Box 1160
Thermal, CA 92274

Darrell Mike, Spokesman
Twenty-nine Palms Band of Mission
Indians
46-200 Harrison Place
Coachella, CA 92236

Appendix J

MMRP (Final EIS only)

